3130-00172

LEAD BASED PAINT INVESTIGATION REPORT FOR MARE ISLAND NAVAL SHIPYARD

EPA REGION IX

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3180-00172

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March 9, 1999

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AABB

WESTON W.O. 04900-006-021-

DCN: 4900-06-21-

Subject: **Additional Histograms for Mare Island Lead Based Paint Study**

Dear Michael:

Enclosed please find six copies of some additional histograms for the Mare Island Lead Based Paint study. These histograms were created to include all of the samples collected at the structures selected for intensive sampling.

The 95th UCL for all samples collected at intensive sampling sites is included below.

Structure	Data Distribution	XRF 95th UCL	Predicted Lab 95th UCL
H-1	Lognormal	10661	8715
H-72	Lognormal	1630	1367
892	Neither	2589	2228

If you have any questions, please call me at (925) 603-7917.

Very truly yours,

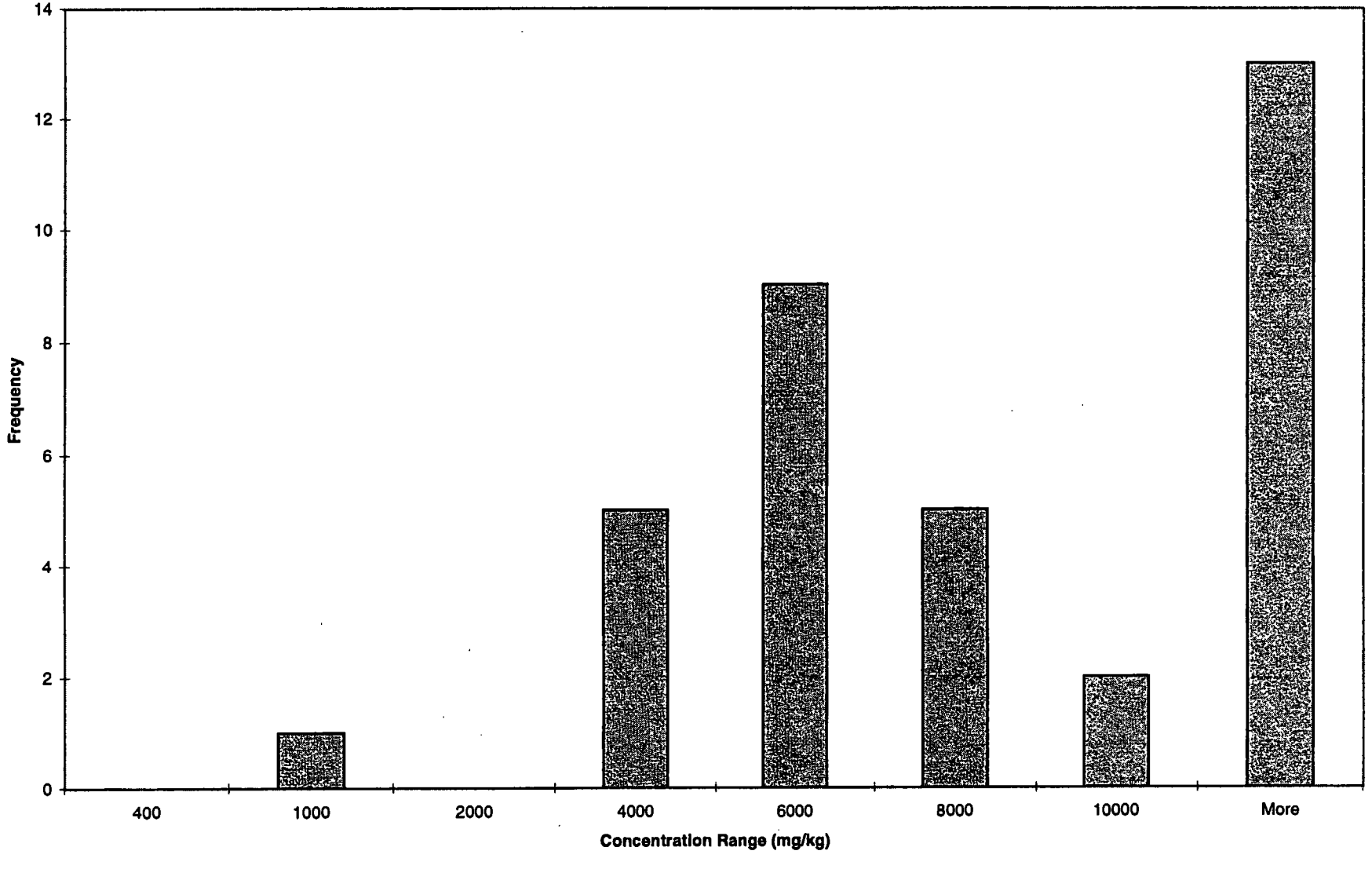
ROY F. WESTON, INC.

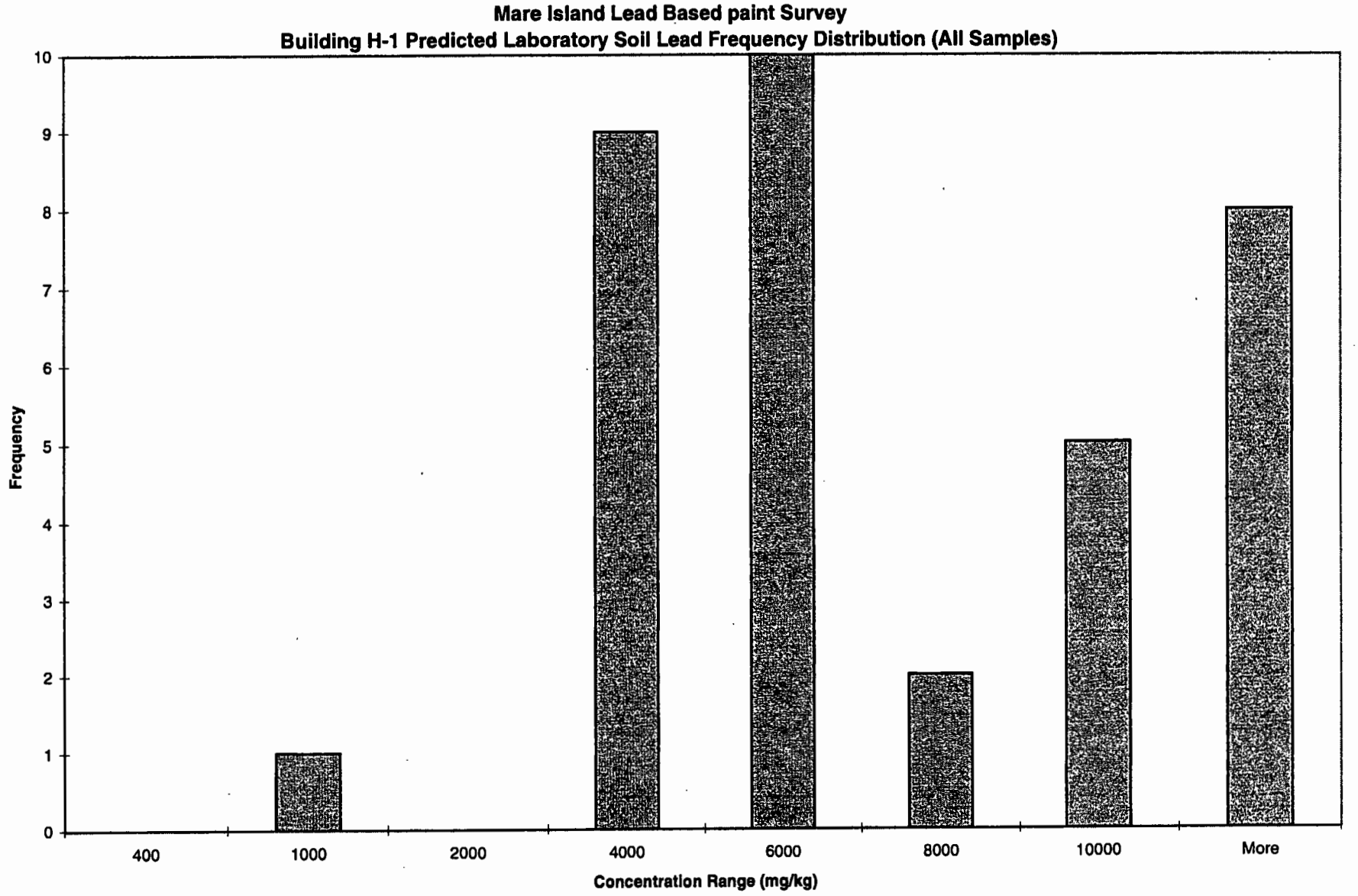
Karla Brasaemle

Karla Brasaemle, R.G.
Site Manager

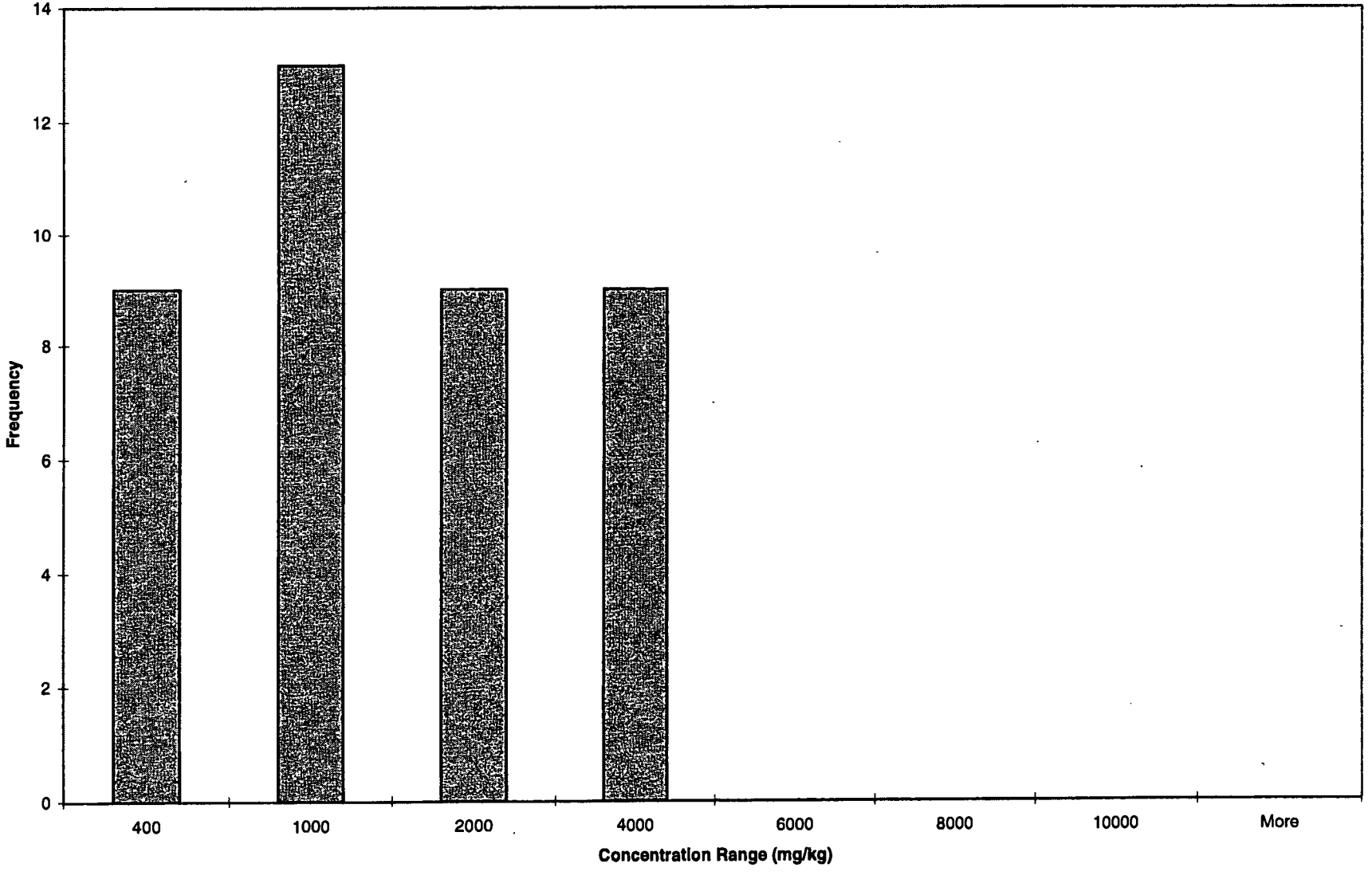
KB/ed
Enclosures

Mare Island Lead Based paint Survey
Building H-1 XRF Soil Lead Frequency Distribution (All Samples)



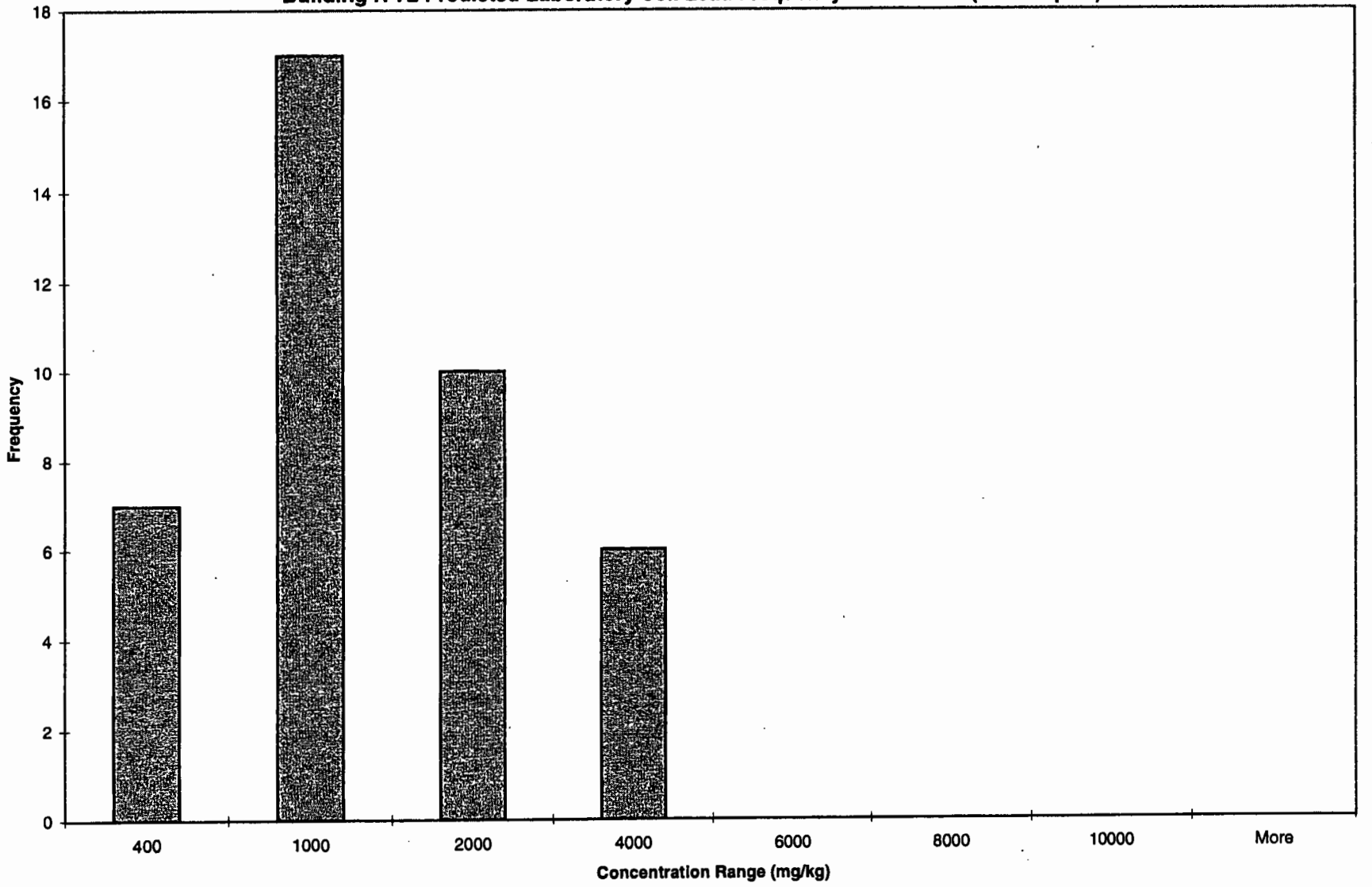

Mare Island Lead Based paint Survey
Building H-1 Predicted Laboratory Soil Lead Frequency Distribution (All Samples)
Frequency
0
1
2
3
4
5
6
7
8
9
10
400
1000
2000
4000
6000
8000
10000
More
Concentration Range (mg/kg)

Mare Island Lead Based paint Survey
Building H-72 XRF Soil Lead Frequency Distribution (All Samples)

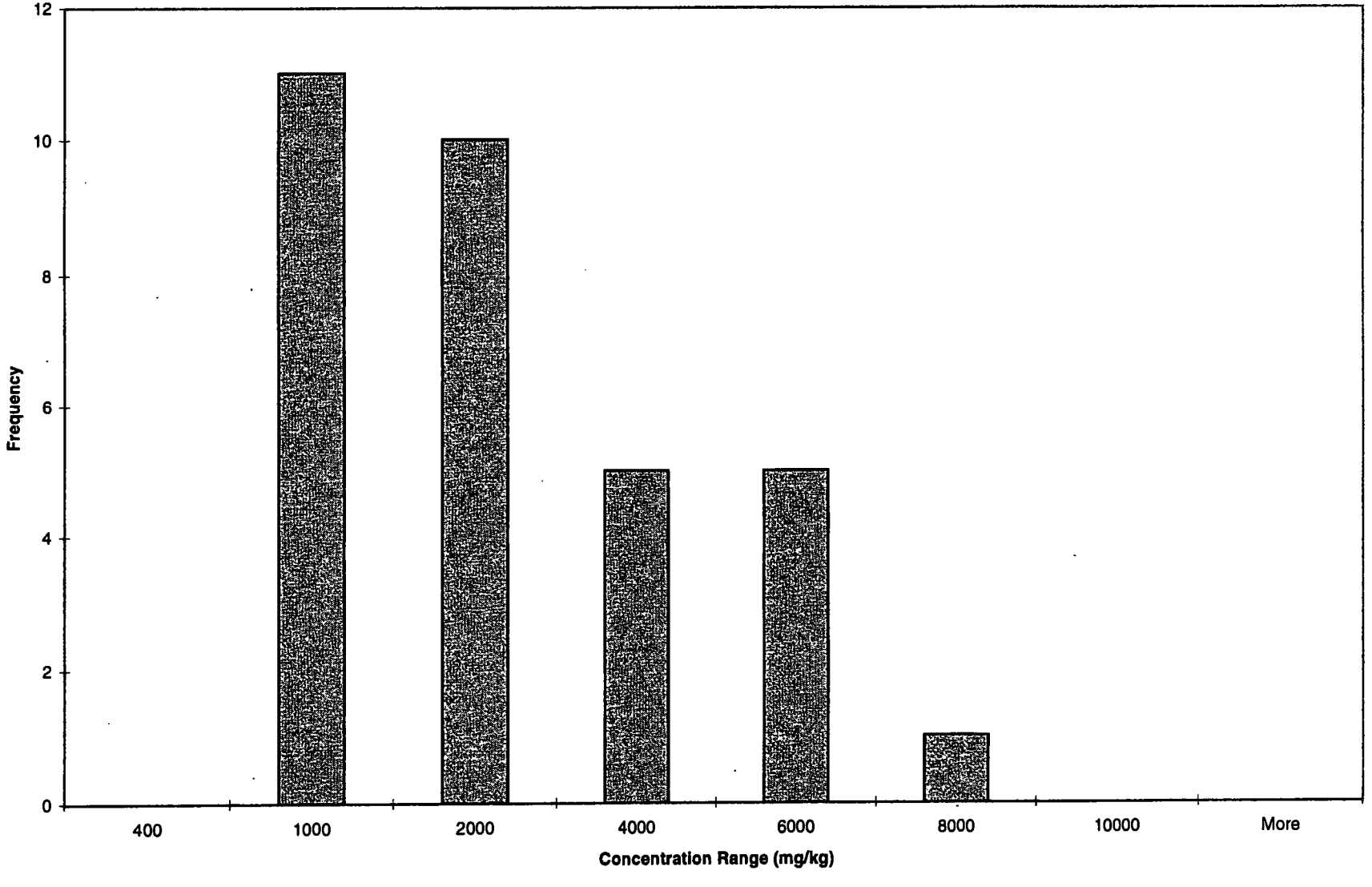


Mare Island Lead Based paint Survey

Building H-72 Predicted Laboratory Soil Lead Frequency Distribution (All Samples)

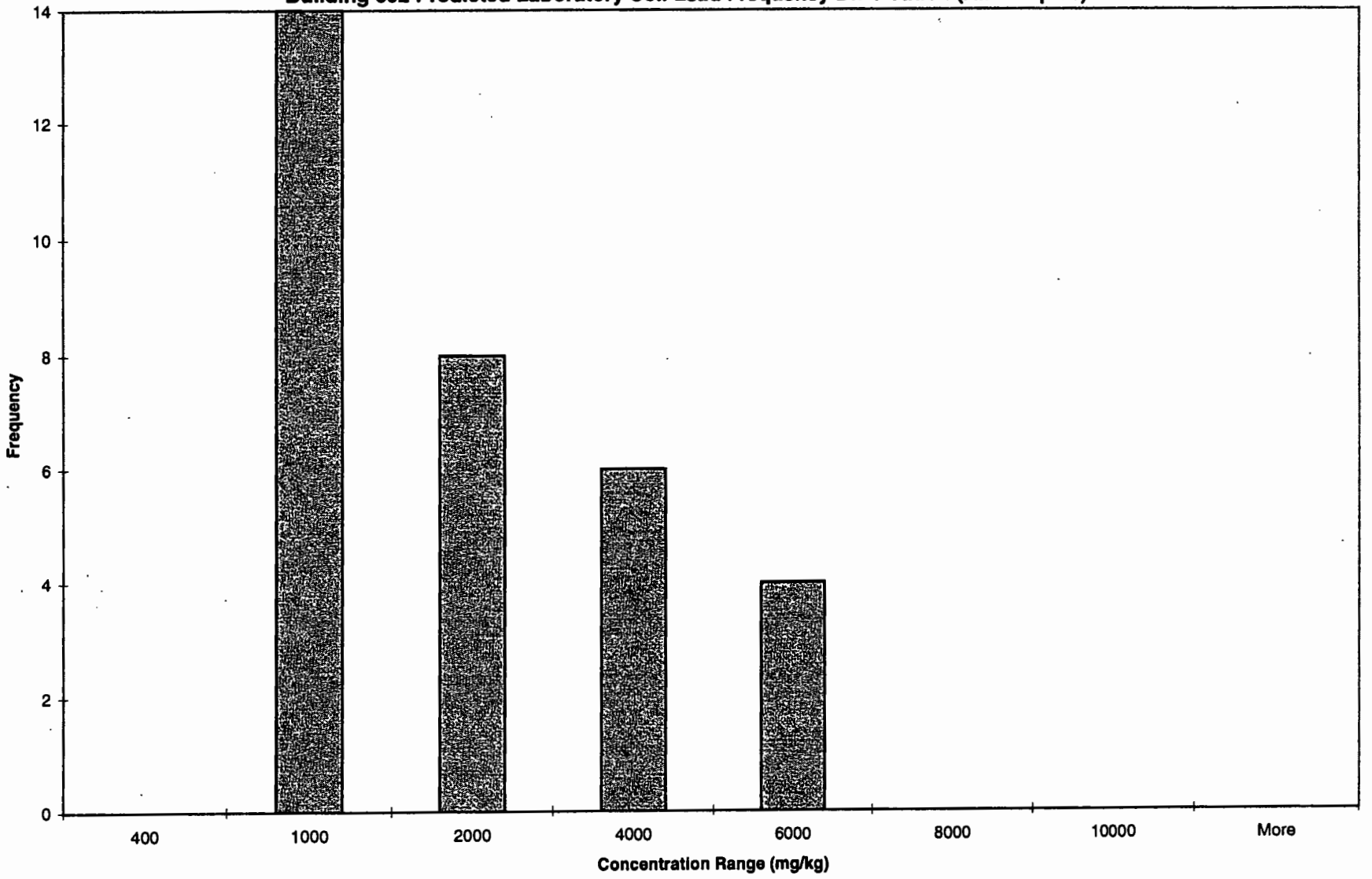


Mare Island Lead Based paint Survey
Building 892 XRF Soil Lead Frequency Distribution (All Samples)



Mare Island Lead Based paint Survey

Building 892 Predicted Laboratory Soil Lead Frequency Distribution (All Samples)



LEAD BASED PAINT INVESTIGATION REPORT
FOR
MARE ISLAND NAVAL SHIPYARD

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, California 94015

Contract No. 68-W9-0046
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February 1999

ARCS QUALITY ASSURANCE CONCURRENCE

Draft Lead Based Paint Investigation Report for Mare Island Naval Shipyard

Project Name:

Work Assignment Name: Federal Facilities Multi-Site, Region IX

Contract Number: 68-W9-0046

Work Assignment Number: 46-35-9379

Approved Responsible Organization: Roy F. Weston, Inc.
2300 Clayton Road, Suite 1580
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Distribution List:

Michael Work, USEPA, Region IX	12 Copies
Roy F. Weston, Inc. (WESTON®)	2 Copies

TABLE OF CONTENTS

1.0 INTRODUCTION

This report summarizes the findings of the lead based paint (LBP) sampling program conducted at Mare Island Naval Shipyard by Roy F. Weston, Inc. (WESTON®) from 2 through 19 November 1998. Mare Island, a former Navy base, is located in Vallejo, California along the eastern edge of San Pablo Bay.

This investigation was conducted to evaluate the presence of lead on the exterior of structures and in the surrounding surface soil in non-residential areas of Mare Island Naval Shipyard. Some structures were selected for more intensive sampling to evaluate whether there was a horizontal gradient in lead concentrations extending outward from the structures. Two structures without LBP were sampled for purposes of comparison. In addition several 1- to 6-inch depth composite samples were collected at the surface sample locations with the highest concentrations to evaluate whether lead is present at depth.

This sampling program was conducted according to the *Focused Lead Based Paint Sampling and Analysis Plan* (WESTON, 1998a) and the *Site Specific Field Sampling Plan (FSP) Addendum for Mare Island Naval Shipyard* (WESTON, 1998b).

2.0 INVESTIGATION

2.1 Structure Selection and Verification of LBP

Structures were initially selected for sampling on the basis of structure type and age and on visual observations made during an 8 September 1998 site visit (see WESTON, 1998b). The selected structures had a high percentage of painted surfaces and were surrounded by soil. Structures surrounded by paved surfaces were not selected for sampling. During the field effort, the Mare Island RPM, Ms. Bonnie Arthur, requested that 5 or 6 additional buildings north of the causeway be sampled.

Prior to sampling efforts, an initial X-ray fluorescence (XRF) field survey was conducted at each structure to confirm the presence or absence of LBP. At two structures where XRF field results indicated an absence of LBP, the structures were sampled. Only structures with LBP north of the causeway were selected for general sampling; these structures included Buildings 571, 617, 621, 653, and 755.

With the structures north of the causeway, structures sampled included:

Intensive sampling	H-1, H-72, and 892
General sampling	H-71, H-80, H-83, H-84, Tank 188B, 396, 571, 617, 621, 650, 653, 658, 755, 926, 928, 1294

The location of these buildings is shown on Figure 1. Individual maps of each structure are included as Figures 2 through 18.

2.2 Sampling Methodology

As the presence of LBP was verified on structures, pin flags were used to mark sampling locations around the building perimeter. The methods by which sampling locations were selected are discussed in Sections 3.0 and 4.0 of the FSP (WESTON, 1998b). This section discusses the field methods and variations on sampling protocol that were used in the field. As a means of clarification, during this discussion the phrase "sampling site" refers to selected structures or buildings; "sampling locations" are points selected around the selected structure.

Pin flags were placed at the structure drip line at each sampling location as determined by a field geologist during the XRF paint survey. The number of flagged sample locations at each structure was selected in accordance with Sections 3.1 and 4.1 of the FSP; however, the number of sampling locations were modified in the field when paved surfaces or impenetrable landscaping were present. The number of individual samples collected at each location was predetermined by the sampling priority assigned to each structure. At intensive sampling sites, four or five soil samples were collected at each sample location. At general sampling sites, two soil samples were collected at each location.

Field personnel collected the first sample at each location from soil immediately adjacent to the structure. At general sampling sites, the second sample was collected at the drip line on the line perpendicular to the structure that intercepted both the first and second soil samples. At intensive sample sites, four or five samples were collected at each sample location: the first one adjacent to the structure, the drip line sample, and three additional samples representing lateral distances equivalent to half, twice and four times the drip line if the distance from the structure to the drip line was greater than 10 inches. If the distance to the drip line was less than 10 inches, samples were collected at 2, 4, and 6 to 10 time the drip line distance. Following sample collection at each location, the pin flag was labeled with the identifying number of every sample collected so that any samples not used in the laboratory could be returned to its respective location.

Each soil sample was collected from the surface to an approximate depth of 1 inch along a horizontal length parallel to the structure. Field personnel wore clean nitrile gloves and used a decontaminated stainless steel trowel for each collected sample. Clearly visible gravel, pebbles and plant material were picked from the soil in the trowel and discarded. Noticeable paint chips were preserved in the sample. The soil sample was placed in a plastic bag that was sealed and numbered.

Standard field procedures and observations, along with additional data, were documented in bound field logbooks. Field personnel recorded the date, time and weather conditions at the time of sampling. Also, structure orientation, sampling location relative to the structure, condition of paint on the structure and direction of surface runoff were documented. At least one soil description was recorded for each site. At the completion of sample collection and field documentation, bagged and labeled samples were returned to the laboratory where they were prepared for analysis (see Section 3.1).

Modifications to this sampling procedure were noted in field logs. The most common variations in sampling protocol were those necessitated by the presence of concrete or other impermeable surfaces near the selected structures. Where pavement or sidewalks were immediately adjacent to the structure, the first sample was collected at the edge of the impermeable surface and subsequent samples were taken according to FSP protocol.

Composite samples were collected at the eight surface sample locations with the highest lead concentrations from a depth of 1 to 6 inches. These samples were collected from the exact same location as the initial sample and were numbered by adding 1000 to the original sample number. These samples were collected so that the vertical gradient in lead concentrations could be assessed. Analytical results are discussed in Section 4.0.

3.0 SAMPLE ANALYSIS

Field X-ray fluorescence (XRF) and confirmation laboratory analysis were performed on soil samples collected from Mare Island. There is a strong correlation between field XRF soil lead concentrations and concentrations determined by laboratory analysis. Field XRF measurements can be used to accurately predict expected laboratory concentrations when a site-specific correlation study is performed.

3.1 Sample Preparation and Analysis

A total of 406 soil samples, excluding quality control samples, collected from Mare Island were analyzed for lead by X-ray fluorescence (XRF) spectrometry using a Niton Corporation Model XL-309 XRF as specified in the *Focused Lead Based Paint Sampling and Analysis Plan* (WESTON, July 1998a). The instrument was calibrated at the beginning and end of each analytical batch using its internal calibration check. In addition, a calibration check was performed using a NIST high concentration lead-in-soil standard (acceptance range 5,100 - 5,900 mg/kg) and a silica sand blank.

Samples were dried at 105°C, if wet, and were then crushed and sieved through a number 10 (2mm) sieve as recommended by the manufacturer to remove gravel from the soil sample matrix. Any paint chips remaining on the sieve were removed and added to the sieved sample. The sample was ground using a grinding mill and sieved through a number 60 sieve. Samples were then analyzed according to the procedures specified in the *Focused Lead Based Paint Sampling and Analysis Plan* (WESTON, July 1998a). Samples were analyzed for 300 source seconds or until the associated uncertainty was less than five percent of the measured concentration, whichever was sooner. The quantitation limits varied slightly from sample to sample but were approximately 40 to 50 mg/kg with the 300 second counting time employed.

A method detection limit (MDL) study was performed, as requested by the EPA Region 9 Quality Assurance Branch, to verify the estimated detection limit of 40 to 50 mg/kg. Seven replicate measurements were obtained on a NIST low concentration lead in soil standard reference material (certified concentration of 18.9 mg/kg). A measurement time of 300 source

seconds was used. Results are summarized in Table 3-1. The mean and standard deviation of the replicate measurements were 45.6 mg/kg and 12.8 mg/kg, respectively. The MDL, defined as three times the standard deviation of the replicate measurements, was determined to be 38.4 mg/kg.

The quantitation limit (QL) is the lowest concentration of an analyte that can be measured at high enough precision to allow comparisons among measurements. XRF QLs have been defined by the industry as 10 times the standard deviation (10 σ) or 3.33 times the MDL. Consequently, based on this study, the method quantitation limit (MQL) is approximately 130 mg/kg.

Field XRF results are summarized in Table 3-2.

3.2 Comparison of XRF and Confirmation Laboratory Results

A total of 43 soil samples, including three blind duplicates, selected to cover a wide range of lead concentrations were also submitted to Quanterra Environmental Services of Santa Anna, California for confirmation analysis. In addition, four rinse blank samples were submitted to the laboratory. Data underwent a comprehensive data validation as specified in the *Focused Lead Based Paint Sampling and Analysis Plan* (WESTON, July 1998a). All data were acceptable and no qualification was required. The data validation memorandum and laboratory result sheets are presented in Appendix A.

A linear regression correlation analysis was performed to compare field XRF and confirmation laboratory results and to determine if XRF field measurements could be used to accurately predict laboratory determined lead concentrations. Three basic assumptions which must fulfilled for appropriate use of linear regression are as follows:

- The relationship between the two data sets is best represented by a straight line (linear) fit.
- The variance is approximately equal for both data sets and variance is independent of concentration.
- There is insignificant measurement error for the independent (reference laboratory) data.

Each of these requirements will be discussed below.

3.2.1 Evaluation of Variance

Variance for both field XRF and confirmation laboratory results are evaluated by analysis of replicate samples. The requirement that both data sets exhibit similar variance appears to be met even though there are only a limited number of replicate analyses.

3.2.1.1 XRF Results

Variance for field XRF measurements was determined by replicate analyses of 37 different samples. The relative percent difference (%RPD) between duplicate measurements averaged 6.1% with higher RPDs near the detection limit where results are less precise. Concentration data and calculated %RPD results are presented in Table 3-3.

3.2.1.2 Confirmation Laboratory Results

Confirmation laboratory variance was evaluated by comparison of results of three sets of blind duplicate analyses. Results are presented in Table 3-3. The relative percent difference (%RPD) between duplicate measurements averaged 0.95% and ranged from 0.76% to 1.53%.

3.2.2 Evaluation of Accuracy

Accuracy was evaluated by analysis of SRMs, NIST certified standards, and, for the confirmation laboratory, analysis of matrix spike and laboratory control samples.

3.2.2.1 XRF Results

Accuracy for XRF analysis was assessed by analysis of soil and paint standard reference materials (SRMs) and NIST calibration check standards. An average concentration of 4854 mg/kg with a % relative standard deviation (%RSD) of 6.3% was obtained for 12 soil SRM measurements. This is slightly lower than the certified value of 5194.8 mg/kg. The observed range of concentrations (4176 to 5322 mg/kg) falls within the 95% prediction interval (3634 - 6756 mg/kg) and all but the lowest four measurements are within the confidence interval range (4864 - 5526 mg/kg) for the reference value.

An average concentration of 5453 mg/kg with a standard deviation of 237 (n=111) was obtained for the NIST high concentration standards associated with sample measurements, within the 95% confidence interval range (5100 - 5900 mg/kg) of the reference value. The %RSD for all measurements was 4.3%. Six high standard calibration check results were below the acceptance range; however, samples associated with these results were re-analyzed after instrument recalibration.

Results for the NIST medium concentration standard averaged 1145 mg/kg with RSD of 3.6% (n=97) compared to a 95% confidence interval of 1131 to 1193 mg/kg.

3.2.2.2 Confirmation Laboratory Results

Confirmation laboratory accuracy was assessed by analysis of laboratory control samples (LCS). LCS recoveries met quality control criteria of 80 to 120 percent of the true concentration. The laboratory also performed matrix spike sample analysis but soil concentrations were significantly higher (greater than 10 times) than spiking concentrations and recoveries could not be calculated.

No standard reference materials were submitted to the laboratory with this batch of samples. SRMs were submitted with a previous batch of samples collected from Mare Island and laboratory performance was acceptable.

3.2.3 Correlation between XRF and Confirmation Laboratory Results

A total of 43 soil samples selected to cover a wide range of lead concentrations were also submitted to Quanterra Environmental Services of Santa Anna, California for confirmation analysis. A comparison of XRF and laboratory results are presented in Table 3-5. In general, results exhibited good agreement. A plot of the confirmation laboratory versus XRF lead concentrations is presented in Figure 19 along with the regression equation and coefficient of determination(R^2). The correlation between laboratory and XRF results is excellent with an R^2 of 0.9862. The slope of the regression line is 0.8155 with an intercept of 116 mg/kg lead.

3.2.4 Predicted Laboratory Lead Concentrations

Predicted laboratory lead concentrations using the regression equations are presented in Table 3-5 with confirmation laboratory results for comparison. Predicted laboratory concentrations accurately reflect measured concentrations for all samples.

3.3 Statistical Analysis

A statistical evaluation of data for each building was performed using MTCA*Stat* 2.1 (Washington State Department of Ecology, 1996). Table 3-6 summarizes the results of the statistical evaluation.

Data were initially evaluated for lognormality and normality using the normal probability plot method. As a measure of how well the log-transformed and untransformed data fit a straight line, the regression R^2 values were calculated. A good fit (defined as $R^2 \geq 0.900$) for the log-transformed data is consistent with the default assumption of a lognormal distribution. If this criterion is not met, the R^2 for the untransformed data is used to test for a normal distribution. Although the probability plot method is acceptable for making distribution decisions, a more exact evaluation was performed using the W test (Shapiro and Wilk, 1965) when there were no censored (undetected) values.

The upper 95% (1-sided) confidence limit for the mean of lognormally distributed data was calculated using Land's method (Land 1971, 1975) as described by the following equation:

$$UCL = \exp(\bar{y} + 0.5 S_y^2 + \frac{s_y H_{1-\alpha}}{\sqrt{n-1}})$$

where

exp = e raised to the indicated power
$\bar{y}$ = mean of the log-transformed data
s_y = standard deviation of the log-transformed data

n = number of samples
α = significance level (0.05)
H = value of H parameter from statistical tables

If no more than 15% of the values were censored, the upper confidence limit was calculated by simple substitution of one-half the method detection limit for non-detected values. In the case where more than 15% but fewer than 50% of the values were non-detect, Cohen's method (Gilbert 1987) was used to calculate an adjusted mean and standard deviation which was then used to calculate the upper confidence limit.

For normally distributed data the upper 95% (1-sided) confidence limit for the mean was calculated from the Student's t distribution using :

$$UCL = \overline{x} + t_{1-\alpha,n-1} \frac{s}{\sqrt{n}}$$

where
$\overline{x}$ = sample mean
s = sample standard deviation
n = number of samples
t = value of t statistic based on a one-sided α of 0.05 and n-1 degrees of freedom

For data which were neither normal or lognormally distributed, the 95% UCL was estimated using the following equation as described by Gilbert (Gilbert 1987, page 139)

$$UCL = \overline{x} + Z_{1-\alpha} \frac{s}{\sqrt{n}}$$

where
$\overline{x}$ = sample mean
s = sample standard deviation
n = number of samples
Z = value of the Z parameter based on a one-sided α of 0.05 and n-1 degrees of freedom

The statistical data evaluation package for each structure is found in Appendix B, which is organized by structure. There is a page of summary statistics, a probability plot and a histogram (frequency distribution) for both the data from XRF instrument and the predicted laboratory results.

4.0 RESULTS AND FINDINGS

4.1 Building H-1

This multi-story building constructed of concrete with wood trim structure is one of the oldest buildings on Mare Island; it was built in 1889. Two XRF surface readings were taken on the structure; LBP was detected in both the surface and subsurface paint at both locations. The highest levels of lead in paint at Mare Island were detected on this structure. The condition of the paint on the building was fair and the paint was observed to be currently peeling at all of the sampling locations. However, there was no evidence of past peeling. Paint chips were visually noted on the soil surface in most of the sampling areas and were also noted in most of the soil samples collected.

The structure drip line was distinct at the sampling locations. Six locations were selected for intensive sampling along the north side of the building (see Figure 2); the building was surrounded by pavement on the other three sides. Soil samples were collected at the structure/soil interface and at four discrete distances laterally from the building; the distances ranged from 0 to 6.4 feet. Five composite samples were collected from 1 to 6 inches below the ground surface in locations where high levels of lead were detected in surface samples. The analytical results (see Table 3-5) ranged from 860 to 14,387 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 34 of 35 samples. The average detected lead concentration in soils adjacent to this structure was 8066 mg/kg; this is the highest average concentration found during this study. This can be compared to a near building average concentration of 9642 mg/kg (see Table 3-6). The high concentrations of lead in soil are consistent with the detection of high concentrations of lead in paint. Generally, higher concentrations of lead were detected in the samples collected adjacent to the building or at the drip line, as demonstrated by the fact that the near building average exceeds the overall average concentration.

At two composite locations (1226 and 1236), the concentrations in the composite samples were 20 to 30 per cent of the ground surface sample lead concentrations. However, at one other sampling location where composite samples (1221, 1222, and 1223) were collected, lead concentrations in the subsurface samples were nearly as high or were higher than the surface samples. It is likely that in the 109 year history of this building, re-landscaping and building maintenance have resulted in distributing paint chips throughout the upper soil profile.

4.2 Building H-71

This structure is a former barracks and was constructed of concrete in 1927. Two XRF surface readings were taken on the structure; LBP was detected at the surface at both locations, and at depth in the paint that covered most of the structure. The condition of the paint on the building was poor to fair and at all of the sampling locations it was noted that the paint was currently peeling. However, at most locations there was no evidence of past peeling. Paint chips were visually noted on the soil surface in most of the sampling areas and were noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Thirteen locations were sampled (see Figure 3); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 160 to 4985 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 10 of 26 samples. The average detected lead concentration in soil surrounding this structure was 1399 mg/kg. Except at two locations, higher levels were detected in the samples taken adjacent to the building.

4.3 Building H-72

This multi-story structure was built in 1927 of concrete. Three XRF surface readings were taken on the structure; LBP was detected in both surface and subsurface paint at all locations. The condition of the paint on the building was fair and it was noted at all of the sampling locations that the paint was currently peeling. However, generally there was no evidence of past peeling. Paint chips were visually noted on the soil surface in the sampling areas and were also noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Eight locations were selected for intensive sampling (see Figure 4) on two sides of the building that were surrounded by soil. Soil samples were collected adjacent to the building and at four discrete distances laterally from the building; the distances ranged from 0 to 4 feet. The results (see Table 3-5) ranged from 224 to 2978 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 16 of 40 samples. The average detected lead concentration in soils adjacent to this structure was 1179 mg/kg. There was no general pattern to the lead concentration in the samples relative to proximity to the building. At three of the eight locations, the 1000 mg/kg lead industrial PRG level was exceeded in samples taken up to 4 feet away from the building.

4.4 Building H-80

This building was constructed of concrete in 1939. Three XRF surface readings were taken on the structure; LBP was detected in the surface paint and at depth at two of the three locations. Only two locations at the north end of the building were sampled because of pavement adjacent to the building or restricted access. The condition of the paint on the building was poor to fair and the paint was currently peeling in some areas but not in others. Some areas displayed evidence of past peeling. Paint chips were not visually noted at the surface of the soils and were not noted in any of the soil samples.

At the two sampling locations (see Figure 5), the structure drip line was distinct. Soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 309 to 679 mg/kg lead; the 1000 mg/kg lead industrial PRG was not exceeded in any of the samples. The average detected lead concentration in soil at this structure was 486 mg/kg. The highest concentration was detected in the drip line samples.

4.5 Building H-83

This building was constructed in 1943 of wood with a concrete foundation. Three XRF surface readings were taken on the structure; LBP was detected in the surface paint at two of the three locations and at depth in one location. The condition of the paint on the building ranged from poor to good and it was noted at all of the sampling locations that the paint was currently peeling, but only slightly at some locations. Also, at most locations there was evidence of past peeling. Generally, paint chips were visually observed on the surface in most of the sampling areas and were noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Eleven locations were sampled (see Figure 6); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 484 to 5046 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 14 of 22 samples. The average detected lead concentration in soil surrounding this structure was 1853 mg/kg. With the exception of three locations, higher lead concentrations were detected in the samples taken adjacent to the building.

4.6 Building H-84

This building was also constructed in 1943 of wood with a concrete foundation. One XRF surface reading was taken on the structure; LBP was detected in the surface paint and at depth. The condition of the paint on the building ranged from poor to good and it was noted at most of the sampling locations that the paint was currently peeling. However, there was no evidence of past peeling. Paint chips were usually not observed on the soil surface and were not observed in most of the soil samples.

The structure drip line was distinct at the sampling locations. Eight locations were sampled (see Figure 6); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 450 to 8516 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 12 of 17 samples. The average detected lead concentration in soil surrounding this structure was 1978 mg/kg. At five of the sampling sites, the highest concentrations were detected in the sample collected adjacent to the structure. In addition, one composite sample (1028) was collected from a depth of 1 inch to 6 inches beneath the surface at a previous sampling location (0028), which had the highest surface sample lead concentration level. The composite sample had only 360 mg/kg lead compared to 8516 mg/kg lead in the surface sample.

4.7 Structure 188B (Water Tank)

This structure is a painted steel water tank constructed in 1915 that sits on the ground surface. One XRF surface reading was taken on the structure and LBP was detected at a moderately high level. The condition of the paint on the structure was fair, but weathered. The paint was not observed to be currently peeling nor was there evidence of past peeling. Also, no paint chips were visually noted on the surface and none were noted in any of the soil samples. Sand was

also noted around the structure, suggesting that paint had been removed from the water tank by sandblasting.

The structure drip line was distinct at the sampling locations. Four locations were sampled (see Figure 7); the soil samples were collected at the tank and one foot away from the tank. The results (see Table 3-5) ranged from 120 to 8597 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in seven of eight samples. The average detected lead concentration in soil surrounding this structure was 5056 mg/kg, which was the second highest average concentration in this study. The highest concentration was found in the drip line samples, which is consistent with the observation of sandblast materials in the drip line area.

4.8 Building 396

The Officers' Club was constructed in 1941 of wood with a concrete foundation. LBP was detected in both the surface and subsurface paint at very low levels. The condition of the paint on the building was fair. At most of the sampling locations the paint was currently peeling; however, there was little evidence of past peeling. Generally, paint chips were not visually noted at the soil surface in most of the sampling areas nor were they noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Twelve locations were sampled (see Figure 8); the soil samples were collected adjacent to the building and near the drip line. The results (see Table 3-5) ranged from 200 to 1863 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 7 of 24 samples. The average detected lead concentration in soil surrounding this structure was 900 mg/kg. With the exception of two locations, higher levels were detected in the samples taken adjacent to the building.

4.9 Building 571

Building 571 is a two-story warehouse-type structure constructed in 1942 of corrugated metal on a concrete foundation. Four XRF surface readings were taken on the structure; LBP was detected in subsurface paint at all locations. The condition of the paint on the building was fair and it was noted at all of the sampling locations that the paint was currently peeling. However, at the same locations there was no evidence of past peeling. Paint chips were visually noted on the soil surface in most of the sampling areas and were also noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Sixteen locations were sampled (see Figure 9); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from non-detect to 7945 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in 6 of 31 samples. The average detected lead concentration in soil surrounding this structure was 797 mg/kg. With the exception of two locations, higher levels were detected in the samples taken adjacent to the building.

4.10 Building 617

This structure is a two-story building constructed in 1942 of wood with concrete footings. Two XRF surface readings were taken on the structure; LBP was detected in the surface and subsurface paint at only one location. The condition of the paint on the building was fair. The paint was currently peeling and there was evidence of past peeling. Paint chips were visually noted on the soil surface in most of the sampling areas and were also observed in most of the soil samples.

The structure drip line was distinct at the sampling locations. Three locations were sampled (see Figure 10); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 182 to 1162 mg/kg lead, the 1000 mg/kg lead industrial PRG was exceeded in only one of six samples. The average detected lead concentration in soil surrounding this structure was 445 mg/kg. There was no pattern in the detections at the three locations.

4.11 Building 621

This structure is a two-story building constructed in 1942 of wood with concrete footings. Only one XRF surface reading was taken on the structure and LBP was detected in the surface and subsurface paint. The condition of the paint on the building was fair and it was noted at all of the sampling locations that the paint was currently peeling. There was evidence of past peeling. Paint chips were visually noted on the soil surface in all of the sampling areas and in the soil samples.

The structure drip line was distinct at the sampling locations. Twenty-one locations were sampled (see Figure 11); the soil samples were collected at the building/soil interface and near the drip line. The results (see Table 3-5) ranged from 192 to 912 mg/kg lead; the 1000 mg/kg lead industrial PRG was not exceeded in any of the 42 samples. The average detected lead concentration in soil surrounding this structure was 419 mg/kg. At two-thirds of the sample locations, the highest concentration was detected in the sampled collected adjacent to the building.

4.12 Building 650

The golf course shed is currently used for golf cart storage and maintenance; this structure is constructed in 1985 of metal. Only one XRF surface reading was taken on the building and a low level of LBP was detected in the surface paint. The condition of the paint on the building was fair. The paint was currently peeling; however, there was no evidence of past peeling. Paint chips were visually noted on the soil surface in the sampling areas but were not noted in any of the soil samples.

The structure drip line was distinct at the sampling locations. Four locations were sampled (see Figure 12); the soil samples were collected at the building/soil interface and near the drip line.

The results (see Table 3-5) ranged from below the method detection limit to 171 mg/kg lead; the 1000 mg/kg lead industrial PRG was not exceeded in any of the 8 samples. The average detected lead concentration in soil surrounding this structure was 59 mg/kg, which was the lowest average for the buildings studied. The samples taken adjacent to the building had higher lead concentrations but there was no substantial difference in concentrations between the two samples collected from each specific location.

4.13 Building 653

This structure is a small, one-story building constructed in 1943 of wood with a concrete foundation. One XRF surface reading was taken on the structure and LBP was detected in both the surface and subsurface paint. The condition of the paint on the building was fair to poor. The paint was currently peeling and there was evidence of past peeling. Paint chips were visually noted at the surface in most of the sampling areas and were also noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Three locations were sampled (see Figure 13); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from 231 to 593 mg/kg lead; the 1000 mg/kg lead industrial PRG was not exceeded in any of the 6 samples. The average detected lead concentration in soil surrounding this structure was 365 mg/kg. The highest lead concentration was detected in the drip line sample at two of the three sampling locations.

4.14 Building 658

This structure is the clubhouse for the golf course; it was constructed of concrete in 1936 and has a wooden deck on the south and east sides. One XRF surface reading was taken on the building and LBP was not detected. The condition of the paint on the building was fair to good. The paint was not currently peeling, nor was there evidence of past peeling. However, paint chips were visually noted on the soil surface in one-half of the sampling areas and were also noted in some of the soil samples.

The structure drip line was distinct at the sampling locations. Four locations were sampled (see Figure 14); the soil samples were collected at the building and near the drip line along the north side of the building. The results (see Table 3-5) ranged from 220 to 644 mg/kg lead, and the 1000 mg/kg lead industrial PRG was not exceeded in any of the 8 samples. The average detected lead concentration in soil surrounding this structure was 338 mg/kg. Generally, the samples taken adjacent to the building had higher lead concentrations.

4.15 Building 755

This structure was constructed of composite siding with a concrete foundation in 1945. Two XRF surface readings were taken on the building and LBP was detected in both the surface and subsurface paint at both locations. The condition of the paint on the building was fair and it was

currently peeling. However, there was no evidence of past peeling. Paint chips were not noted in the sampling areas nor in the soil samples collected.

The structure drip line was distinct at the sampling locations. Three locations were sampled (see Figure 15); the soil samples were collected near to the building and near the drip line. The results (see Table 3-5) ranged from 229 to 448 mg/kg lead, and the 1000 mg/kg lead industrial PRG was not exceeded in any of the 6 samples. The average detected lead concentration in soil surrounding this structure was 237 mg/kg. There was no pattern in the detections at the three locations.

4.16 Building 892

This structure is a one-story building (constructed in 1935) with wood siding on one wing and corrugated metal on the other wing. Three XRF surface readings were taken on the structure; LBP was detected in the surface at two locations and in subsurface paint at one location. The condition of the paint on the building was fair and at all of the sampling locations the paint was observed to be currently peeling. Generally there was no evidence of past peeling. Paint chips were visually observed on the surface in the sampling areas and were also noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Six locations were selected for intensive sampling (see Figure 16). Soil samples were collected from the building/soil interface and at four discrete distances laterally from the building; the distances ranged from 0 to 5.6 feet. Two composite samples were collected from 1 to 6 inches below the ground surface; these samples were collected from the exact locations where elevated concentrations of lead were found in surface samples. The results (see Table 3-5) ranged from 512 to 5951 mg/kg lead; the 1000 mg/kg lead industrial PRG was exceeded in 18 of 32 samples. Most of the detections above 100 mg/kg were found in samples collected from the wing of the building that had corrugated metal siding. The average detected lead concentration in soil surrounding this structure was 2065 mg/kg. Generally, higher levels were detected in the samples taken closer to the building, as shown by the fact that the average drip line and near building sample concentration of 2443 mg/kg exceeds the average concentration. At three of the six locations, the 1000 mg/kg lead industrial PRG level was exceeded in samples collected at distances up to 4 feet away from the building.

The composite samples (1196 and 1197) were collected from locations where the surface lead concentrations were the highest (5951 and 4855 mg/kg lead, respectively). The results for these two composite samples, 830 and 602 mg/kg lead, respectively, were significantly lower then the lead concentrations in the surface samples.

4.17 Building 926

This two-story building was constructed of concrete in 1939. One XRF surface reading was taken on the structure and LBP was detected in both surface and subsurface paint. The condition

of the paint on the building was fair and the paint was currently peeling; however, there was no evidence of past peeling. Paint chips were visually observed at the surface in most of the sampling areas and were also noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Twenty locations were sampled (see Figure 17); the soil samples were collected at the building and near the drip line. The results (see Table 3-5) ranged from less than the method detection limit to 3976 mg/kg lead; the 1000 mg/kg lead industrial PRG was exceeded in 13 of 40 samples. The average detected lead concentration in soil surrounding this structure was 1250 mg/kg. The highest concentration was generally found in the drip line sample.

4.18 Building 928

This structure is a parking garage constructed of concrete; it was built in 1941. One XRF surface reading was taken on the structure and LBP was detected in both surface and subsurface paint. The condition of the paint on the building was fair to poor. Generally, the paint was currently peeling; however, there was no evidence of past peeling. Paint chips were not noted on the surface in the sampling areas nor in most of the soil samples collected.

The structure drip line was distinct at the sampling locations. Four locations were sampled (see Figure 17); the soil samples were collected adjacent to the building and near the drip line. The results (see Table 3-5) ranged from 190 to 1940 mg/kg lead, and the 1000 mg/kg lead industrial PRG was exceeded in only one of eight samples. This location was behind the garage at the base of the steep slope between this structure and Building 892. The average detected lead concentration in soil surrounding this structure was 567 mg/kg. Generally, the samples collected adjacent to the building had higher lead concentrations.

4.19 Building 1294

This building was constructed in 1970 of concrete. Two XRF surface readings were taken on the structure; LBP was not detected. The condition of the paint on the building was good. Generally, the paint was not currently peeling nor was there evidence of past peeling. Paint chips were not observed in most of the sampling areas nor were they noted in most of the soil samples.

The structure drip line was distinct at the sampling locations. Twenty-two locations were sampled (see Figure 18); the soil samples were collected adjacent to the building and near the drip line. The results (see Table 3-5) ranged from 153 to 499 mg/kg lead; the 1000 mg/kg lead industrial PRG was not exceeded. The average detected lead concentration in soil surrounding this structure was 93 mg/kg, which was the second lowest average concentration. With the exception of two locations, higher levels were detected in the samples taken adjacent to the building.

5.0 CONCLUSIONS

Several conclusions can be drawn from this investigation:

- LBP was detected on wood, metal, and concrete surfaces.
- The highest concentrations of lead in LBP were found on wooden or metal surfaces.
- The highest concentrations of lead were detected in soil collected near Building H-1, the oldest building in this study. The second highest concentrations were detected near the water tank; the structure had been sandblasted to remove old paint
- In general the highest lead concentrations were detected in soil collected either at the soil/building interface or at the drip line.
- The concentration of lead generally decreased with increasing distance from the structure and drip line.
- The lowest concentrations of lead were found in soil collected near structures with no LBP or with very low levels of lead in the exterior paint.

6.0 REFERENCES

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TABLES

Table 3-1
Mare Island XRF Method Detection Limit Study
NIST Low Concentration (18.9 mg/kg) Standard

Replicate Number	Concentration (mg/kg)
1	19
2	44
3	46
4	37
5	53
6	51
7	58
8	57
mean	45.6
std dev	12.8

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
001	2477	
002	6045	
003	855	
004	752	
005	4259	
006	2690	
007	3107	
008	3437	
009	1025	
010	894	
011	1350	
011 dup	1328	
012	451	
013	2075	
014	1452	
015	1412	
016	866	
017	1267	
018	1562	
019	1336	
020	759	
021	2022	
021 dup	1986	
022	553	
023	1730	
024	1483	
025	3923	
026	2074	
027	1907	
028	10300	
029	1251	
029 dup	1190	
030	2886	
031	1638	
032	409	
033	1909	
034	506	
035	1135	
037	816	
036 repeat	514	
038	1178	
039	476	
040	482	
041	237	
042	690	
043	68	J
044	79	J

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
045	110	J
046	469	
047	83	J
047 dup	78	J
048	261	
049	100	J
050	100	J
051	55	J
052	63	J
053	62	J
054	76	J
054 dup	59	J
055	65	J
056	50	J
057	69	J
058	79	J
059	100	J
060	69	J
061	50	J
061 dup	44	J
062	45	J
063	74	J
064	64	J
065	60	J
066	83	J
067	108	J
068	115	J
069	111	J
070	75	J
070 dup	52	J
071	104	J
072	127	J
073	139	J
074	64	J
075	56	J
076	45	J
077	66	J
078	104	J
078 dup	83	J
079	102	J
080	57	J
081	72	J
082	57	J
083	95	J
084	111	J
085	63	J
085 dup	60	J
086	89	J
087	746	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
088	524	
089	944	
090	379	
091	304	
092	208	
092 dup	199	
093	1910	
094	895	
095	1870	
096	3494	
097	5971	
098	2645	
099	1258	
100	1135	
101	3290	
102	2336	
102 dup	2261	
103	678	
104	480	
105	1345	
106	683	
107	881	
108	747	
109	321	
110	293	
110 dup	298	
111	54	J
112	213	
113	26	U
114	8	U
115	21	U
116	70	J
117	21	U
118	34	U
119	198	
120	198	
120 dup	219	
121	114	J
122	172	
123	2190	
124	1744	
125	17	U
126	1555	
127	68	J
128	328	
129	133	
130	1225	
131	4733	
132	724	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
133	34	U
134	133	
135	8	U
136	128	
137	3578	
138	2566	
138 dup	2624	
139	383	
140	182	
131 dup	4784	
141	275	
142	1938	
143	191	
144	1113	
145	258	
146	1970	
147	416	
147 dup	410	
148	391	
149	1882	
150	747	
151	2034	
152	3910	
153	235	
154	422	
155	323	
156	131	
157	99	J
157 dup	102	J
155 rep	357	
156 rep	126	J
158	91	J
152 rep	4086	
151 rep	2024	
159	123	J
160	182	
161	995	
162	647	
163	1549	
164	502	
165	769	
166	1501	
166 dup	1494	
167	1256	
168	341	
169	194	
170	103	J
171	945	
172	305	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
173	330	
174	135	
175	730	
176	181	
177	2142	
178	2090	
179	1773	
180	1536	
181	864	
182	616	
183	540	
184	127	J
185	262	
186	142	
187	328	
188	403	
189	647	
190	186	
191	5043	
192	735	
193	642	
194	758	
195	486	
196	7155	
197	5811	
198	4669	
198 dup	4662	
189 dup	659	
178 dup	2045	
199	4285	
200	3027	
201	1059	
202	1012	
203	1097	
204	666	
205	738	
206	1130	
207	1367	
208	772	
209	1243	
210	1433	
211	2968	
212	1998	
213	1052	
214	598	
215	505	
216	4966	
216 dup	4934	
217	2909	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
218	3006	
219	1286	
220	2192	
221	17500	
222	12500	
223	11700	
224	6042	
225	2802	
226	11100	
228	16200	
229	9274	
229 dup	8083	
230	4474	
231	912	
232	2333	
233	4982	
234	4291	
235	2938	
237	10400	
238	8627	
236	14500	
239	6566	
240	5235	
241	4806	
243	6317	
242	6096	
239 dup	6650	
244	5718	
245	2707	
246	5312	
247	11200	
248	10900	
249	6397	
250	4083	
251	2066	
252	2326	
253	2894	
254	760	
255	3510	
255 dup	3299	
256	1297	
257	1049	
258	2162	
259	1590	
260	1512	
261	1044	
262	1108	
263	1504	
264	550	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
265	400	
258 dup	2090	
266	643	
267	543	
268	716	
269	1292	
270	559	
271	2906	
272	2736	
273	3354	
274	1669	
274 dup	1637	
275	822	
276	728	
277	436	
278	309	
279	380	
280	669	
281	334	
282	346	
283	223	
284	300	
285	132	
286	456	
287	750	
288	745	
289	250	
290	2085	
291	2237	
292	878	
293	4669	
295	4835	
298	8019	
300	10400	
303	2658	
305	831	
308	3003	
310	3094	
313	67	J
314	29	U
315	37	U
316	29	U
317	51	J
318	34	U
319	57	J
320	61	J
1028	299	
1196	875	
1197	596	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
1221	13900	
1222	13800	
1223	15200	
1228	4534	
1236	2750	
1236 dup	2736	
237	16200	
431	186	
432	151	
433	316	
434	138	
435	210	
436	407	
437	453	
438	444	
438 dup	422	
400	445	
401	104	J
402	316	
405	25	U
404	88	J
403	60	J
402 dup	287	
406	1851	
406 dup	1853	
407	55	J
408	2102	
421	834	
409	264	
410	333	
411	348	
412	227	
413	9600	
414	177	
413 dup	9280	
415	93	J
416	55	J
417	1519	
418	1023	
419	1126	
420	68	J
422	37	U
423	2024	
424	52	J
425	89	J
426	104	J
427	998	
428	219	
429	564	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
430	171	
439	141	
427 dup	1048	
429 dup	572	
440	263	
441	239	
442	585	
443	147	
444	156	
445	1282	
446	708	
447	81	J
448	132	
449	288	
450	176	
451	362	
452	316	
453	158	
454	165	
455	174	
456	374	
457	721	
458	501	
459	705	
460	527	
461	429	
462	363	
463	553	
464	143	
465	350	
466	325	
466 dup	312	
467	454	
468	647	
469	311	
470	404	
471	210	
472	279	
473	790	
474	585	
474 dup	593	
475	976	
476	697	
477	630	
478	403	
479	764	
480	419	
481	276	
482	272	

Table 3-2
Mare Island XRF Soil Lead Results

Sample No.	XRF Result (mg/kg)	Qualifier
483	312	
484	344	
485	93	J
486	231	
487	252	
487 dup	233	
488	261	
489	700	
490	478	
Mean	1638	
Median	595	
Std Dev	2737	

Table 3-3
Mare Island
Field XRF Duplicate Sample Precision

Sample No.	Result (mg/kg)	Duplicate (mg/kg)	% RPD
11	1350	1328	1.6%
29	1251	1190	5.0%
47	83	78	6.2%
54	76	59	25.2%
61	50	44	12.8%
70	75	52	36.2%
78	104	83	22.5%
85	63	60	4.9%
92	208	199	4.4%
102	2336	2261	3.3%
120	198	219	10.1%
131	4733	4784	1.1%
138	2566	2624	2.2%
151	2034	2024	0.5%
152	3910	4086	4.4%
155	323	357	10.0%
156	131	126	3.9%
157	99	102	3.0%
166	1501	1497	0.3%
178	2090	2045	2.2%
189	647	659	1.8%
198	4669	4662	0.2%
216	4966	4934	0.6%
229	9794	8083	19.1%
236	2750	2736	0.5%
239	6566	6650	1.3%
255	3510	3299	6.2%
258	2162	2090	3.4%
274	1669	1637	1.9%
438	444	422	5.1%
402	316	287	9.6%
406	1851	1853	0.1%
413	9600	9280	3.4%
427	998	1048	4.9%
429	564	572	1.4%
466	325	312	4.1%
474	585	593	1.4%
		mean %RPD	6.1%

Table 3-4
Comparison Between XRF and Confirmation Laboratory Results

Sample No.	Lab Result (mg/kg)	XRF Result (mg/kg)	
002	5660	6045	
007	2690	3107	
009	1110	1025	
018	1450	1562	
025	3270	3923	
028	9130	10300	
034	474	506	
092	194	208	
096	3620	3494	
102	2120	2336	
105	1370	1345	
123	2040	2190	
131	3960	4733	
137	3130	3578	
150	683	747	
173	304	330	
179	1600	1773	
191	4330	5043	
196	6210	7155	
197	5200	5811	
215	435	505	
224	5400	6042	
238	6810	8627	
263	1300	1504	
265	357	400	
267	468	543	
268	668	716	
277	371	436	
278	283	309	
283	204	223	
285	108	132	
406	1480	1851	
408	1860	2102	
413	7110	9600	
417	1330	1519	
421	697	834	
423	1550	2024	
427	851	998	
437	389	453	
473	767	790	
908	7150	9600	dup of 413
909	3930	4733	dup of 131
910	1320	1504	dup of 263

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
H-1	adjacent	221	17500		14387
H-1		222	12500		10310
H-1	drip line	223	11700		9657
H-1		224	6042		5043
H-1		225	2802		2401
H-1	adjacent	226	11100		9168
H-1		227	16200		13327
H-1	drip line	228	16200		13327
H-1		229	9274		7679
H-1		230	4474		3765
H-1	adjacent	231	912		860
H-1		232	2333		2019
H-1	drip line	233	4982		4179
H-1		234	4291		3615
H-1		235	2938		2512
H-1	adjacent	236	14500		11941
H-1		237	10400		8597
H-1	drip line	238	8627		7151
H-1		239	6566		5471
H-1		240	5235		4385
H-1	adjacent	241	4806		4035
H-1		242	6096		5087
H-1	drip line	243	6317		5268
H-1		244	5718		4779
H-1		245	2707		2324
H-1	adjacent	246	5312		4448
H-1		247	11200		9250
H-1	drip line	248	10900		9005
H-1		249	6397		5333
H-1		250	4083		3446
H-1	adjacent	1221	13900		11452
H-1		1222	13800		11370
H-1	drip line	1223	15200		12512
H-1	drip line	1228	4534		3814
H-1	adjacent	1236	2750		2359
H-1		1236 dup	2736		2347
H-1		229 dup	8083		6708
H-1		239 dup	6650		5539
H-71	adjacent	087	746		724
H-71	drip line	088	524		543
H-71	adjacent	089	944		886
H-71	drip line	090	379		425
H-71	adjacent	091	304		364
H-71	drip line	092	208		286
H-71	adjacent	093	1910		1674
H-71	drip line	094	895		846
H-71	adjacent	095	1870		1641
H-71	drip line	096	3494		2965

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
H-71	adjacent	097	5971		4985
H-71	drip line	098	2645		2273
H-71	adjacent	099	1258		1142
H-71	drip line	100	1135		1042
H-71	adjacent	101	3290		2799
H-71	drip line	102	2336		2021
H-71	adjacent	103	678		669
H-71	drip line	104	480		508
H-71	adjacent	105	1345		1213
H-71	drip line	106	683		673
H-71	adjacent	107	881		835
H-71	drip line	108	747		725
H-71	adjacent	109	321		378
H-71	drip line	110	293		355
H-71	adjacent	111	54	J	160
H-71	drip line	112	213		290
H-71		092 dup	199		278
H-71		102 dup	2261		1960
H-71		110 dup	298		359
H-72	adjacent	251	2066		1801
H-72		252	2326		2013
H-72	drip line	253	2894		2476
H-72		254	760		736
H-72		255	3510		2978
H-72	adjacent	256	1297		1174
H-72		257	1049		972
H-72	drip line	258	2162		1879
H-72		259	1590		1413
H-72		260	1512		1349
H-72	adjacent	261	1044		967
H-72		262	1108		1020
H-72	drip line	263	1504		1343
H-72		264	550		565
H-72		265	400		442
H-72	adjacent	266	643		640
H-72		267	543		559
H-72	drip line	268	716		700
H-72		269	1292		1170
H-72		270	559		572
H-72	adjacent	271	2906		2486
H-72		272	2736		2347
H-72	drip line	273	3354		2851
H-72		274	1669		1477
H-72		275	822		786
H-72	adjacent	276	728		710
H-72		277	436		472
H-72	drip line	278	309		368
H-72		279	380		426

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
H-72		280	669		662
H-72	adjacent	281	334		388
H-72		282	346		398
H-72	drip line	283	223		298
H-72		284	300		361
H-72		285	132		224
H-72	adjacent	286	456		488
H-72		287	750		728
H-72	drip line	288	745		724
H-72		289	250		320
H-72		290	2085		1816
H-72		255 dup	3299		2806
H-72		258 dup	2090		1820
H-72		274 dup	1637		1451
H-80	adjacent	039	476		504
H-80	drip line	040	482		509
H-80	adjacent	041	237		309
H-80	drip line	042	690		679
H-83	adjacent	001	2477		2136
H-83	drip line	002	6045		5046
H-83	adjacent	003	855		813
H-83	drip line	004	752		729
H-83	adjacent	005	4259		3589
H-83	drip line	006	2690		2310
H-83	adjacent	007	3107		2650
H-83	drip line	008	3437		2919
H-83	adjacent	009	1025		952
H-83	drip line	010	894		845
H-83	adjacent	011	1350		1217
H-83	drip line	012	451		484
H-83	adjacent	013	2075		1808
H-83	drip line	014	1452		1300
H-83	adjacent	015	1412		1268
H-83	drip line	016	866		822
H-83	adjacent	017	1267		1149
H-83	drip line	018	1562		1390
H-83	adjacent	019	1336		1206
H-83	drip line	020	759		735
H-83	adjacent	021	2022		1765
H-83	drip line	022	553		567
H-83		011 dup	1328		1199
H-83		021 dup	1986		1736
H-84	adjacent	023	1730		1527
H-84	drip line	024	1483		1325
H-84	adjacent	025	3923		3315
H-84	drip line	026	2074		1807
H-84	adjacent	027	1907		1671
H-84	drip line	028	10300		8516

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
H-84	adjacent	029	1251		1136
H-84	drip line	030	2886		2470
H-84	adjacent	031	1638		1452
H-84	drip line	032	409		450
H-84	adjacent	033	1909		1673
H-84	drip line	034	506		529
H-84	adjacent	035	1135		1042
H-84	drip line	036	514		535
H-84	adjacent	037	816		782
H-84	drip line	038	1178		1077
H-84	drip line	1028	299		360
H-84		029 dup	1190		1087
Tank 188B	adjacent	293	4669		3924
Tank 188B	drip line	295	4835		4059
Tank 188B	adjacent	298	8019		6656
Tank 188B	drip line	300	10400		8597
Tank 188B	adjacent	303	2658		2284
Tank 188B	drip line	305	831		794
Tank 188B	adjacent	308	3003		2565
Tank 188B	drip line	310	3094		2639
396	adjacent	159	123	J	216
396	drip line	160	182		264
396	adjacent	161	995		927
396	drip line	162	647		644
396	adjacent	163	1549		1379
396	drip line	164	502		525
396	adjacent	165	769		743
396	drip line	166	1501		1340
396	adjacent	167	1256		1140
396	drip line	168	341		394
396	adjacent	169	194		274
396	drip line	170	103	J	200
396	adjacent	171	945		887
396	drip line	172	305		365
396	adjacent	173	330		385
396	drip line	174	135		226
396	adjacent	175	730		711
396	drip line	176	181		264
396	adjacent	177	2142		1863
396	drip line	178	2090		1820
396	adjacent	179	1773		1562
396	drip line	180	1536		1369
396	adjacent	181	864		821
396	drip line	182	616		618
396		166 dup	1494		1334
571	adjacent	400	445		479
571	drip line	401	104	J	201
571	adjacent	402	316		374

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
571	drip line	403	60	J	165
571	adjacent	404	88	J	188
571	drip line	405	25	U	136
571	adjacent	406	1851		1626
571	drip line	407	55	J	161
571	adjacent	408	2102		1830
571	adjacent	409	264		331
571	drip line	410	333		388
571	adjacent	411	348		400
571	drip line	412	227		301
571	adjacent	413	9600		7945
571	drip line	414	177		260
571	adjacent	415	93	J	192
571	drip line	416	55	J	161
571	adjacent	417	1519		1355
571	drip line	418	1023		950
571	adjacent	419	1126		1034
571	drip line	420	68	J	172
571	adjacent	421	834		796
571	drip line	422	37	U	146
571	adjacent	423	2024		1767
571	drip line	424	52	J	158
571	adjacent	425	89	J	189
571	drip line	426	104	J	201
571	adjacent	427	998		930
571	drip line	428	219		295
571	adjacent	429	564		576
571	drip line	430	171		256
571		402 dup	287		350
571		406 dup	1853		1627
571		413 dup	9280		7684
617	adjacent	443	147		236
617	drip line	444	156		243
617	adjacent	445	1282		1162
617	drip line	446	708		693
617	adjacent	447	81	J	182
617	drip line	448	132		224
621	adjacent	449	288		351
621	drip line	450	176		260
621	adjacent	451	362		411
621	drip line	452	316		374
621	adjacent	453	158		245
621	drip line	454	165		251
621	adjacent	455	174		258
621	drip line	456	374		421
621	adjacent	457	721		704
621	drip line	458	501		525
621	adjacent	459	705		691

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
621	drip line	460	527		546
621	adjacent	461	429		466
621	drip line	462	363		412
621	adjacent	463	553		567
621	drip line	464	143		233
621	adjacent	465	350		401
621	drip line	466	325		381
621	adjacent	467	454		486
621	drip line	468	647		644
621	adjacent	469	311		370
621	drip line	470	404		446
621	adjacent	471	210		287
621	drip line	472	279		344
621	adjacent	473	790		760
621	drip line	474	585		593
621	adjacent	475	976		912
621	drip line	476	697		684
621	adjacent	477	630		630
621	drip line	478	403		445
621	adjacent	479	764		739
621	drip line	480	419		458
621	adjacent	481	276		341
621	drip line	482	272		338
621	adjacent	483	312		371
621	drip line	484	344		397
621	adjacent	485	93	J	192
621	drip line	486	231		304
621	adjacent	487	252		322
621	drip line	488	261		329
621	adjacent	489	700		687
621	drip line	490	478		506
621		466 dup	312		371
621		474 dup	593		600
621		487 dup	233		306
650	adjacent	313	67	J	171
650	drip line	314	29	U	140
650	adjacent	315	37	U	146
650	drip line	316	29	U	140
650	adjacent	317	51	J	158
650	drip line	318	34	U	144
650	adjacent	319	57	J	163
650	drip line	320	61	J	166
653	adjacent	437	453		485
653	drip line	438	444		478
653	adjacent	439	141		231
653	drip line	440	263		331
653	adjacent	441	239		311
653	drip line	442	585		593

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
653		427 dup	1048		971
653		429 dup	572		583
653		438 dup	422		460
658	adjacent	183	540		556
658	drip line	184	127	J	220
658	adjacent	185	262		330
658	drip line	186	142		232
658	adjacent	187	328		384
658	drip line	188	403		445
658	adjacent	189	647		644
658	drip line	190	186		268
755	adjacent	431	186		268
755	drip line	432	151		239
755	adjacent	433	316		374
755	drip line	434	138		229
755	adjacent	435	210		287
755	drip line	436	407		448
892	adjacent	191	5043		4229
892		192	735		715
892	drip line	193	642		640
892		194	758		734
892		195	486		512
892	adjacent	196	7155		5951
892		197	5811		4855
892	drip line	198	4669		3924
892		199	4285		3610
892		200	3027		2585
892	adjacent	201	1059		980
892		202	1012		941
892	drip line	203	1097		1011
892		204	666		659
892		205	738		718
892	adjacent	206	1130		1038
892		207	1367		1231
892	drip line	208	772		746
892		209	1243		1130
892		210	1433		1285
892	adjacent	211	2968		2536
892		212	1998		1745
892	drip line	213	1052		974
892		214	598		604
892		215	505		528
892	adjacent	216	4966		4166
892		217	2909		2488
892	drip line	218	3006		2567
892		219	1286		1165
892		220	2192		1904
892	adjacent	1196	875		830

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
892		1197	596		602
892		178 dup	2045		1784
892		189 dup	659		653
892		198 dup	4662		3918
892		216 dup	4934		4140
926	adjacent	113	26	U	137
926	drip line	114	8	U	123
926	adjacent	115	21	U	133
926	drip line	116	70	J	173
926	adjacent	117	21	U	133
926	drip line	118	34	U	144
926	adjacent	119	198		278
926	drip line	120	198		278
926	adjacent	121	114	J	209
926	drip line	122	172		256
926	adjacent	123	2190		1902
926	drip line	124	1744		1538
926	adjacent	125	17	U	130
926	drip line	126	1555		1384
926	adjacent	127	68	J	172
926	drip line	128	328		384
926	adjacent	129	133		225
926	drip line	130	1225		1115
926	adjacent	131	4733		3976
926	drip line	132	724		706
926	adjacent	133	34	U	144
926	drip line	134	133		225
926	adjacent	135	8	U	123
926	drip line	136	128		220
926	adjacent	137	3578		3034
926	drip line	138	2566		2209
926	adjacent	139	383		428
926	drip line	140	182		264
926	adjacent	141	275		340
926	drip line	142	1938		1697
926	adjacent	143	191		272
926	drip line	144	1113		1024
926	adjacent	145	258		326
926	drip line	146	1970		1723
926	adjacent	147	416		455
926	drip line	148	391		435
926	adjacent	149	1882		1651
926	drip line	150	747		725
926	adjacent	151	2034		1775
926	drip line	152	3910		3305
926		120 dup	219		295
926		131 dup	4784		4017
926		138 dup	2624		2256

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
926		147 dup	410		450
926		151 rep	2024		1767
926		152 rep	4086		3448
928	adjacent	153	235		308
928	drip line	154	422		460
928	adjacent	155	323		379
928	drip line	156	131		223
928	adjacent	157	99	J	197
928	drip line	158	91	J	190
928	adjacent	291	2237		1940
928	drip line	292	878		832
928		155 rep	357		407
928		156 rep	126	J	219
928		157 dup	102	J	199
1294	adjacent	043	68	J	172
1294	drip line	044	79	J	180
1294	adjacent	045	110	J	206
1294	drip line	046	469		499
1294	adjacent	047	83	J	184
1294	drip line	048	261		329
1294	adjacent	049	100	J	198
1294	drip line	050	100	J	198
1294	adjacent	051	55	J	161
1294	drip line	052	63	J	167
1294	adjacent	053	62	J	167
1294	drip line	054	76	J	178
1294	adjacent	055	65	J	169
1294	drip line	056	50	J	157
1294	adjacent	057	69	J	172
1294	drip line	058	79	J	180
1294	adjacent	059	100	J	198
1294	drip line	060	69	J	172
1294	adjacent	061	50	J	157
1294	drip line	062	45	J	153
1294	adjacent	063	74	J	176
1294	drip line	064	64	J	168
1294	adjacent	065	60	J	165
1294	drip line	066	83	J	184
1294	adjacent	067	108	J	204
1294	drip line	068	115	J	210
1294	adjacent	069	111	J	207
1294	drip line	070	75	J	177
1294	adjacent	071	104	J	201
1294	drip line	072	127	J	220
1294	adjacent	073	139	J	229
1294	drip line	074	64	J	168
1294	adjacent	075	56	J	162
1294	drip line	076	45	J	153

Table 3-5
Mare Island
Predicted Laboratory Lead Concentrations

Building No.	Location	Sample No.	XRF Result (mg/kg)	Qualifier	Pred Lab Result (mg/kg, from regression eqn)
1294	adjacent	077	66	J	170
1294	drip line	078	104	J	201
1294	adjacent	079	102	J	199
1294	drip line	080	57	J	163
1294	adjacent	081	72	J	175
1294	drip line	082	57	J	163
1294	adjacent	083	95	J	194
1294	drip line	084	111	J	207
1294	adjacent	085	63	J	167
1294	drip line	086	89	J	189
1294		047 dup	78	J	180
1294		054 dup	59	J	164
1294		061 dup	44	J	152
1294		070 dup	52	J	158
1294		078 dup	83	J	184
1294		085 dup	60	J	165
		Mean	797		
		Median	312		
		Std Dev	1338		

Table 3-6
Mare Island Lead Based Paint Survey
Building Summary Statistics

Building	Date Constructed	Construction Material	Paint Condition	XRF Dripline/Near Bldg Avg (normal) (mg/kg)	Dripline/Near Bldg Avg Conc (lognormal) (mg/kg)	XRF Maximum Conc. (mg/kg)	Data Distribution (normal, lognormal, neither)	XRF 95% Upper Confidence Limit (mg/kg)	Predicted Lab Dripline/Near Bldg Avg (normal) (mg/kg)	Lab Dripline/Near Bldg Avg Conc (lognormal)	Predicted Lab Dripline/Near Bldg Maximum Conc. (mg/kg)	Lab 95% Upper Confidence Limit (mg/kg)	Number of Samples
H-1	1889	concrete/wood	fair	9,642	10,427	17,500	normal	11,429	7,979	8,550	14,387	9,437	23
H-71	1927	concrete	poor-fair	1,292	1,399	5,971	lognormal	2,389	1,170	1,177	4,985	1,722	26
H-72	1926	concrete	fair	1,278	1,318	3,354	lognormal	1,933	1,158	1,174	2,851	1,599	24
H-80	1939	concrete	poor-fair	471	486	690	lognormal	1,170	500	508	678	873	4
H-83	1943	wood	poor-good	1,847	1,853	6,045	lognormal	2,541	1,622	1,621	5,045	2,141	22
H-84	1943	wood	poor-good	1,997	1,978	10,300	lognormal	3,413	1,745	1,704	8,515	2,707	17
Tank 188	1915	metal	fair	4,688	5,056	10,400	lognormal	11,820	3,939	4,193	8,597	9,115	8
396	1941	wood	fair	825	900	2,142	lognormal	1,476	789	811	1,862	1,130	24
571	1942	corrugated metal	fair	858	797	9,600	lognormal	1,750	816	708	7,944	1,083	31
617	1942	wood	fair	417	445	1,282	lognormal	3,872	456	465	1,161	1,425	6
621	1942	wood	fair	414	419	976	lognormal	492	454	455	911	505	42
650	1985	metal	fair	59	59	67	lognormal	59	164	164	170	162	8
653	1943	wood	fair-poor	354	365	585	lognormal	691	404	409	593	590	6
658	1936	concrete	fair-good	329	338	647	lognormal	604	384	388	643	540	8
755	1945	concrete/siding	fair	234	237	407	lognormal	379	307	308	447	399	6
892	1935	wood/metal	fair	2,443	2,478	7,156	neither	3,188	2,108	2,126	5,950	2,716	20
926	1939	concrete	fair	1,110	1,250	4,733	lognormal	3,821	1,021	1,043	3,975	1,597	40
928	1941	concrete	fair-poor	552	567	2,237	lognormal	2,725	566	559	1,940	911	8
1294	1970	concrete	good	93	90	469	neither	109	191	191	498	205	44

TABLE 4-1
RESULTS FROM XRF
LEAD-BASED PAINT SURVEY OF STRUCTURES
MARE ISLAND NAVAL SHIPYARD

Building	Location (Description)	Paint Color	L mg/cm^2 (surface reading)	K mg/cm^2 (deep reading)	Depth Index	Comments
H-1	Concrete	beige	>1.4	2.3 - 20	8.43	
H-1	Wood	lt. beige	>5	42 ± 26	8.90	
H-71	Concrete		>>5	1.9 to 17	9.52	
H-71	Concrete	red	2.5 ± 0.6		2.89	
H-72	Concrete	beige	0.2 ± 0.1	-3.7 to 7.4	4	
H-72	Concrete	dk. yellow	0.6 ± 0.2	-2 to 6.8	5.55	Sand observed near structure, possible sandblasting.
H-72	Handrail	beige	3.4 ± 0.7	2.8 to 31	2.48	On west side of building
H-80	Concrete	dk. yellow	0.0 ± 0.1			No LBP
H-80	Concrete	beige	2.4 ± 0.3		2.35	
H-80	Concrete	rose	>4.0			
H-83	Wood	beige	>>5.0	17 ± 10	2.09	
H-83	Wood	white	0 ± 0.1			No LBP
H-83	Concrete foundation	beige	>>5.0			
H-84	Wood	beige	>>5.0	9.3 to 34	2.75	
Tank 188B	Metal	grey	>>5.0	2.2 to 30	1.64	

TABLE 4-1
RESULTS FROM XRF
LEAD-BASED PAINT SURVEY OF STRUCTURES
MARE ISLAND NAVAL SHIPYARD
(continued)

Building	Location (Description)	Paint Color	L mg/cm² (surface reading)	K mg/cm² (deep reading)	Depth Index	Comments
396	Wood	beige	1.0 ± 0.5	-0.7 to 5.5	7.78	
396	Wood	beige	1.0 ± 0.2		3.36	
571	Corrugated metal	bright white	1.5 ± 0.3	-2 ± 4.9	5.93	
571	Corrugated metal	white/ green	>2.1	3.4 to 13	10	
571	Corrugated metal	white/ green	>2.3	5.4 ± 3.5	10	
571	Corrugated metal	green	2.9 ± 0.3	3.5 to 21	1.68	
617	Wood footing	red	0.0 ± 0.1			No LBP
617	Wood	yellow	L > >5.0	0.4 to 9.8	3.8	
621	Wood	yellow	L > >5.0	2.5 to 30	6.1	
650	Metal	beige	L >0.4			Golf Course Shed
653			> >5.0	-2.5 to 6.7	3.3	
658	Concrete		0.0 ± 0.1			Golf Course Club House; no LBP
755	Composite Siding/ Concrete	grey	> >5.0	-1.2 to 10	3.44	

TABLE 4-1
RESULTS FROM XRF
LEAD-BASED PAINT SURVEY OF STRUCTURES
MARE ISLAND NAVAL SHIPYARD
(continued)

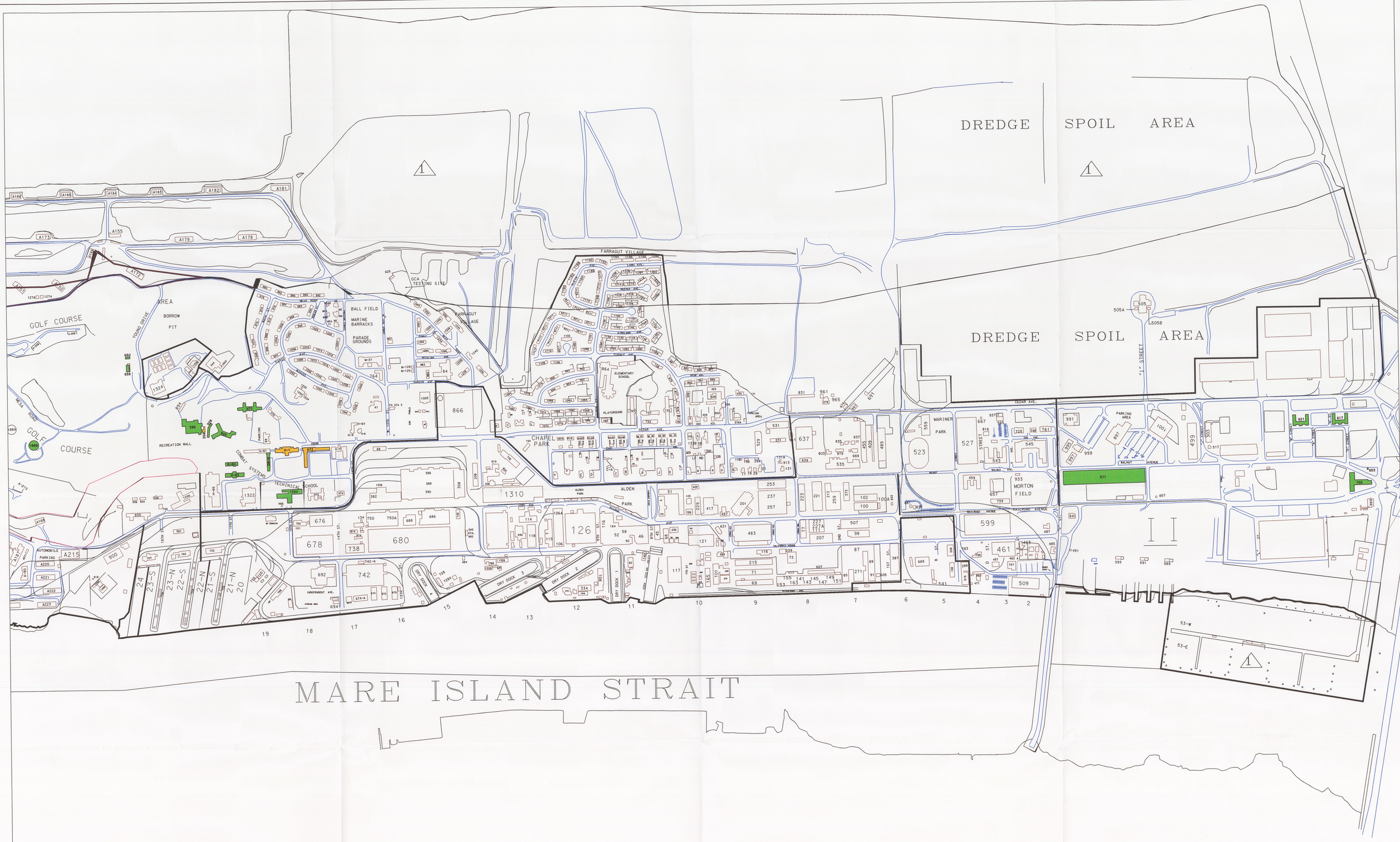
Building	Location (Description)	Paint Color	L mg/cm² (surface reading)	K mg/cm² (deep reading)	Depth Index	Comments
755	Composite Siding/ Concrete	grey	> >5.0	3.0 to 28	3.8	
892	Wood		3.9 ± 2.2	-0.5 to 10	5.28	
892	Metal		>1.5			
892	Wood	grey	0.0 ± 0.1			No LBP
926	Concrete		2.8 ± 0.6	-1.0 to 8.5	6.00	BOQ
928	Concrete		3.6 ± 0.7	-4.2 to 8.7	4.90	Garage
1294	Concrete	beige	0.0 ± 0.1			No LBP
1294	Wood window cover	beige	0.0 n 0.1			No LBP

Table 4-2

AVERAGE DETECTED CONCENTRATIONS

Structure	Average of Predicted Laboratory Lead Concentration (mg/kg)	Average Detected XRF Concentrations (mg/kg)
H-1	6694	8066
H-71	1177	1399
H-72	1077	1179
H-80	508	486
H-83	1621	1853
H-84	1704	1978
Tank 188B	4193	5056
396	811	900
571	708	797
617	465	445
621	455	419
650	164	59
653	409	365
658	388	338
755	308	237
892	1800	2065
926	1043	1250
928	559	567
1294	191	93

FIGURES



Field Sampling Plan
Mare Island

FIGURE

1

3130-00172 1of 1

H-1

1221(C),11452
1222(C),11370
1223(C),12512
0221(0'),14387
0222(0.8'),10310
0223(1.6'),9657
0224(3.2'),5043
0225(6.4'),2401

1228(C),3814
0226(0'),9168
0227(1.4'),13327
0228(2.4'),13327
0229(3.4'),7679
0230(5.4'),3765
0231(0'),860
0232(0.5'),2019
0233(1.0'),4179
0234(2.0'),3615
0235(4.0'),2512

1236(C),2359
0236(0'),11941
0237(0.5'),8597
0238(1.0'),7151
0239(2.0'),5471
0240(4.0'),4385
0241(1.6'),4035
0242(2.5'),5087
0243(2.6'),5268
0244(3.6'),4779
0245(5.6'),2324
0246(0'),4448
0247(0.5'),9250
0248(1.0'),9005
0249(2.0'),5333
0250(4.0'),3446

0 10 20
Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

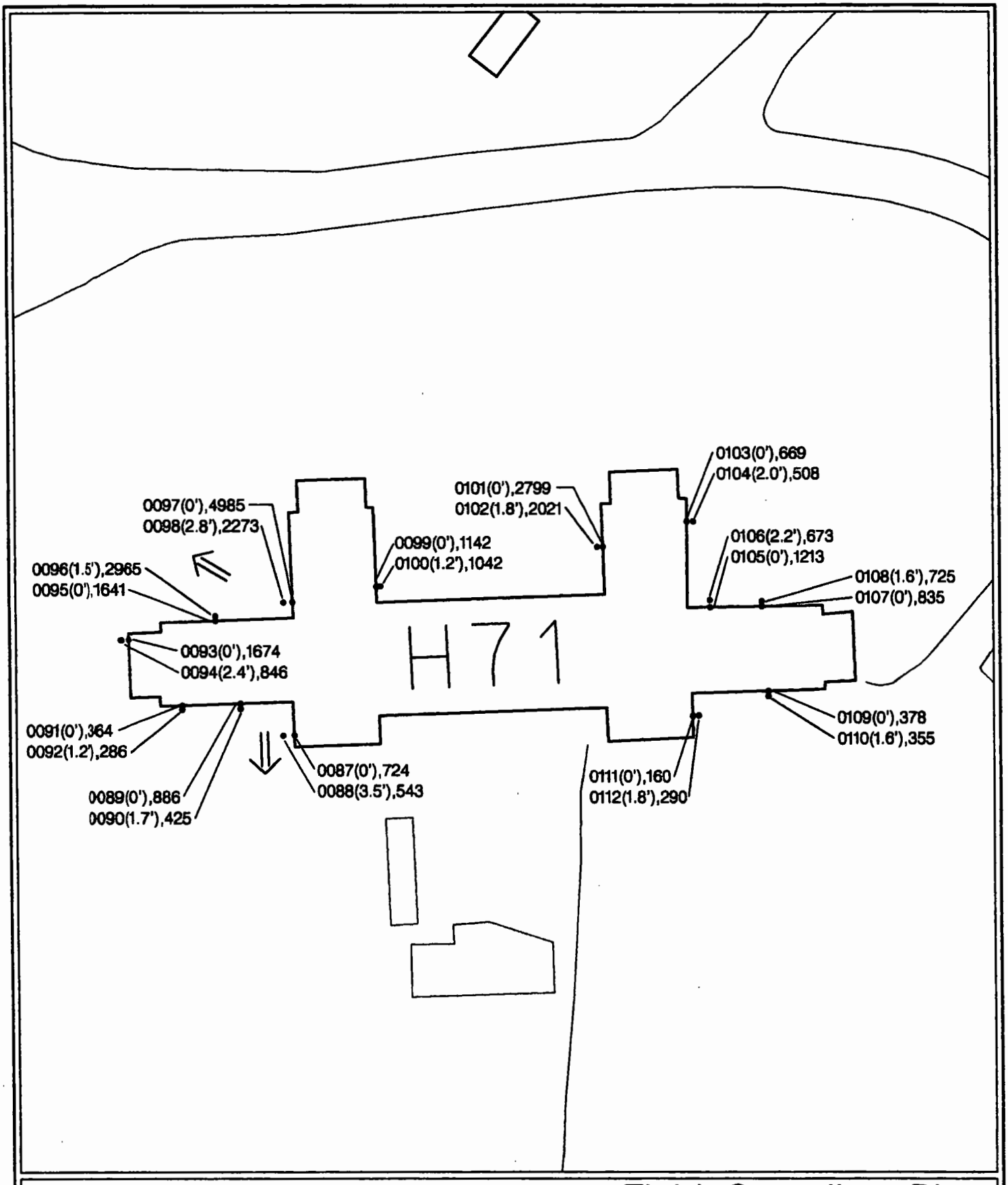
(C) 1" to 6" Composite Sample

Field Sampling Plan
Mare Island

FIGURE
2

WESTON

nfsdir/mareisle/fig2.dgn 12-16-1998

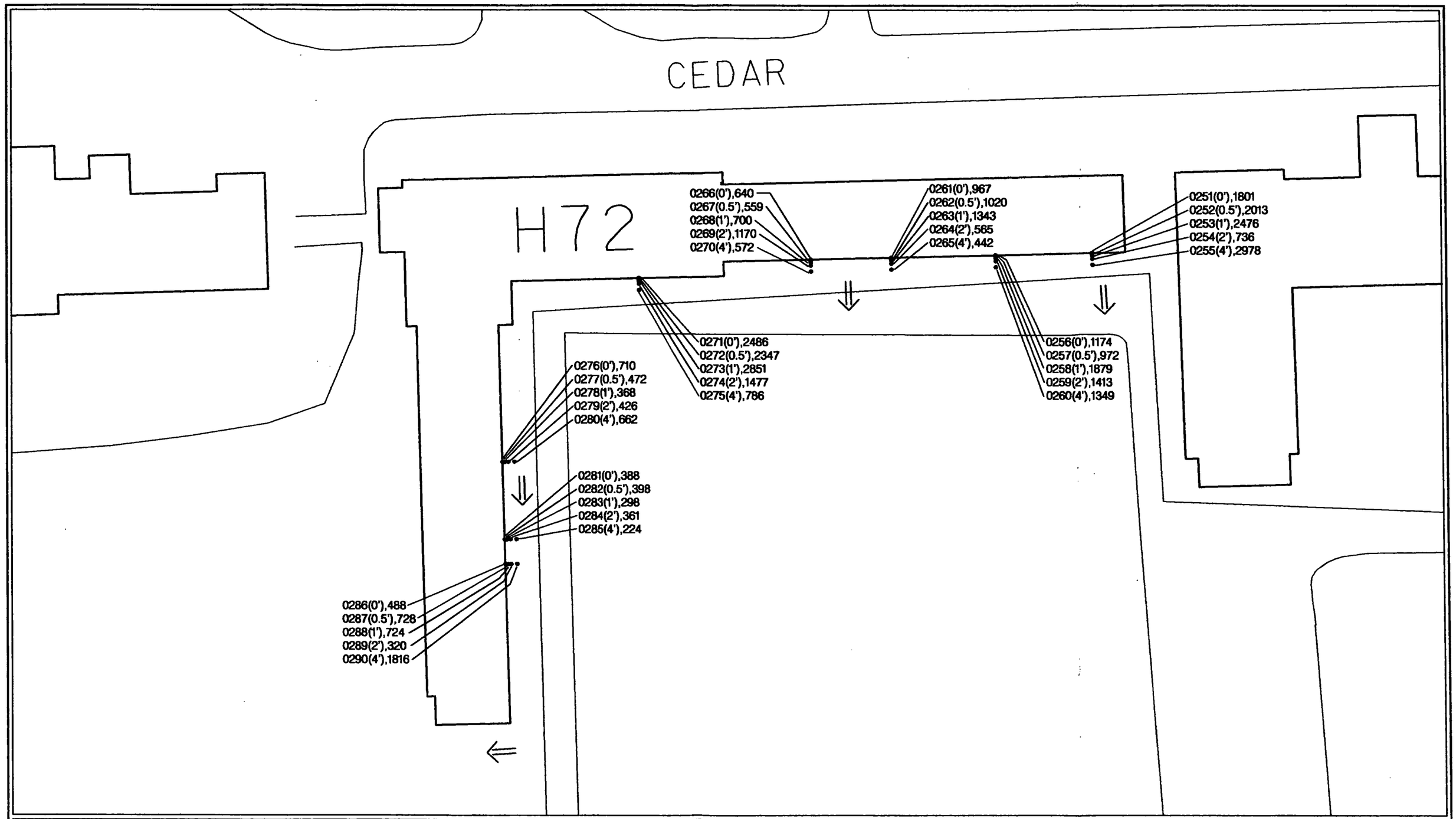


Field Sampling Plan
Mare Island

FIGURE
3

WESTON MANAGERS DESIGNERS FANTS

nfsdir/mareisle/fig3.dgn 12-16-1998



0 15 30
Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

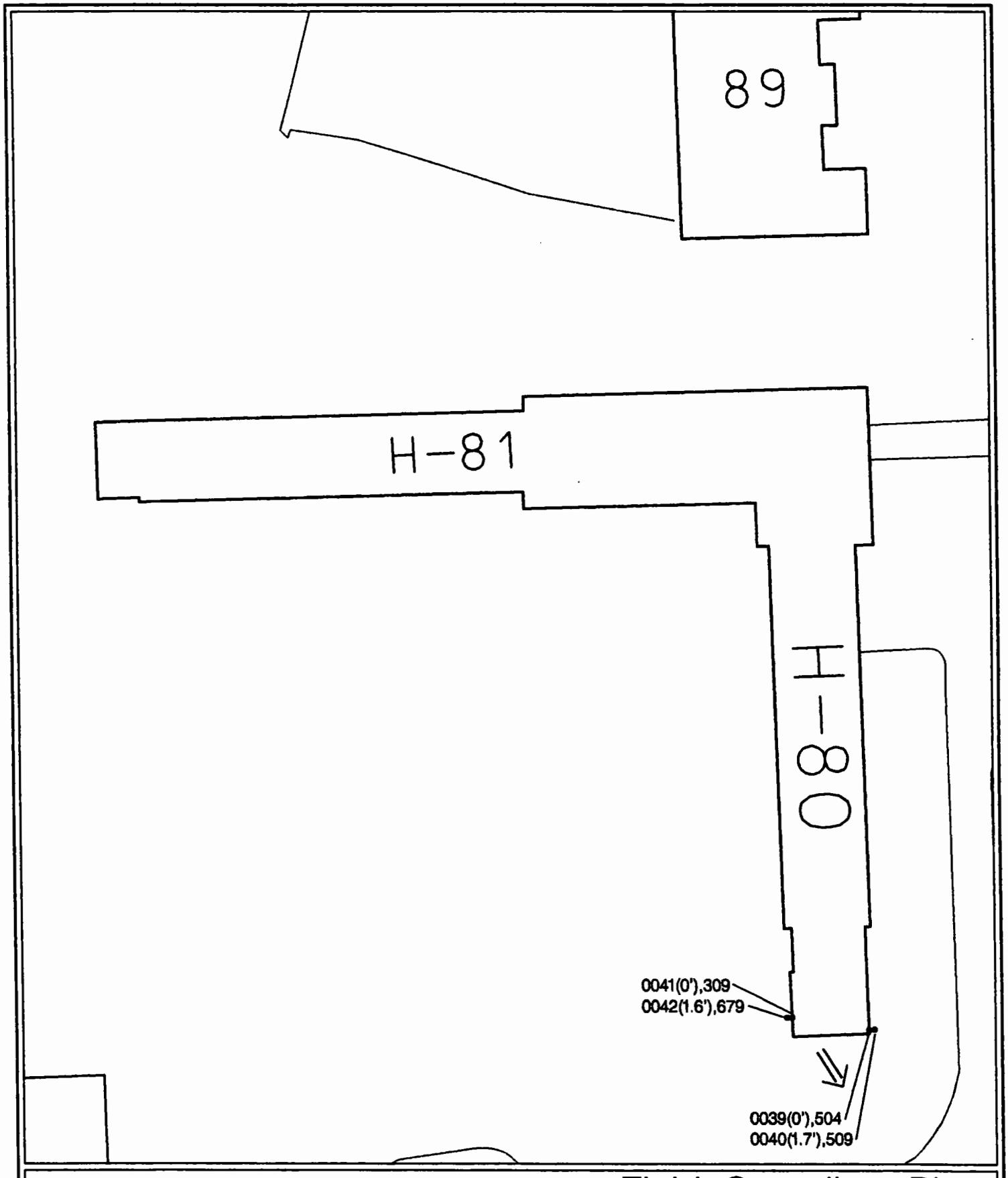
Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
4

WESTON MANAGERS ENGINEERS/CONSULTANTS

nfsdir/mareisle/fig4.dgn 12-16-1998

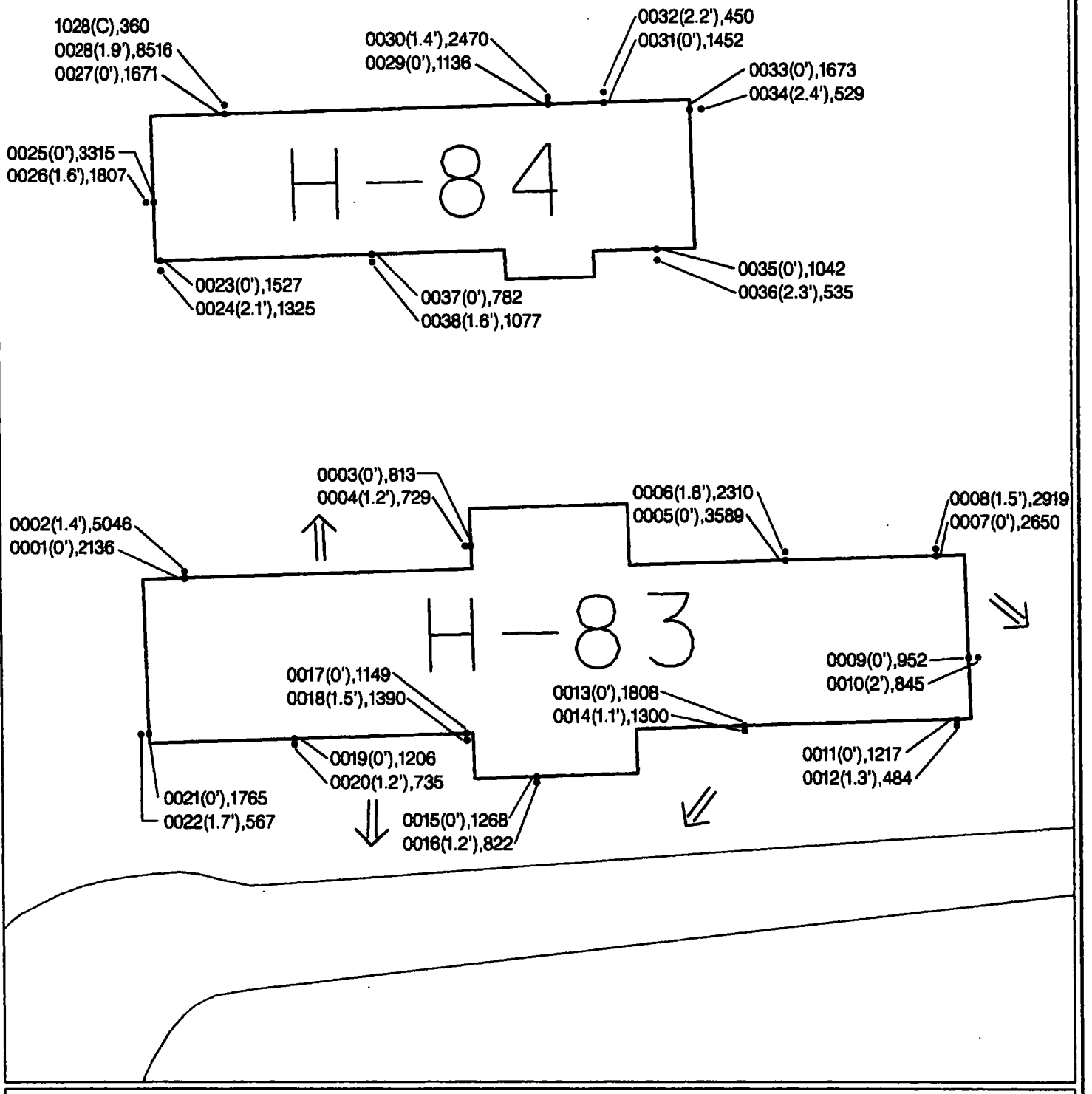


Field Sampling Plan
Mare Island

FIGURE
5

WESTON
MANAGERS DESIGNERS/CONSULTANTS

pfsdir/mareisle/fig5.dgn 12-16-1998



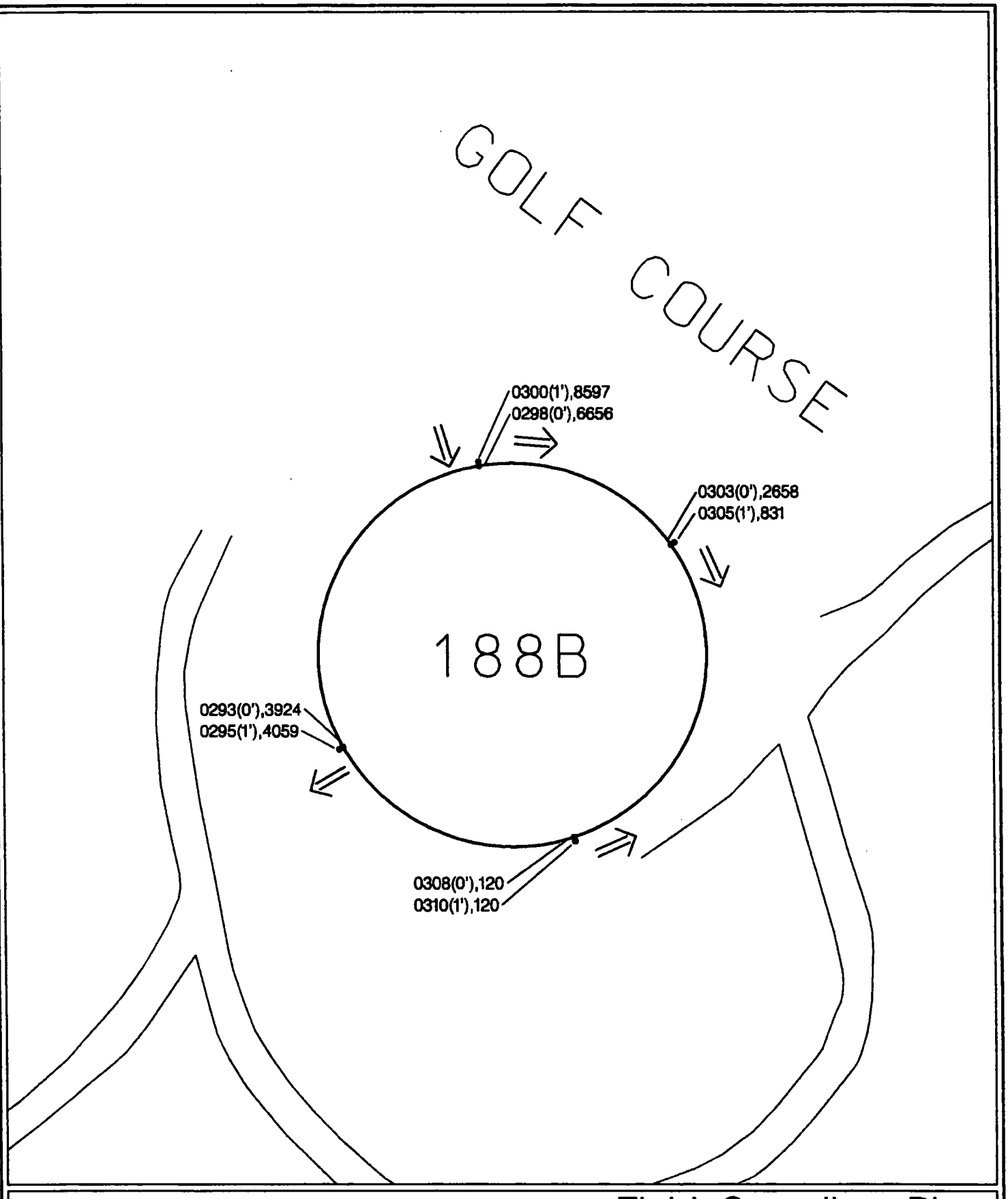
Field Sampling Plan
Mare Island

FIGURE

6

WESTON MANAGERS DESIGNERS/CONSULTANTS

pfsdir/mareisle/fig6.dgn 12-16-1998



0 15 30

Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

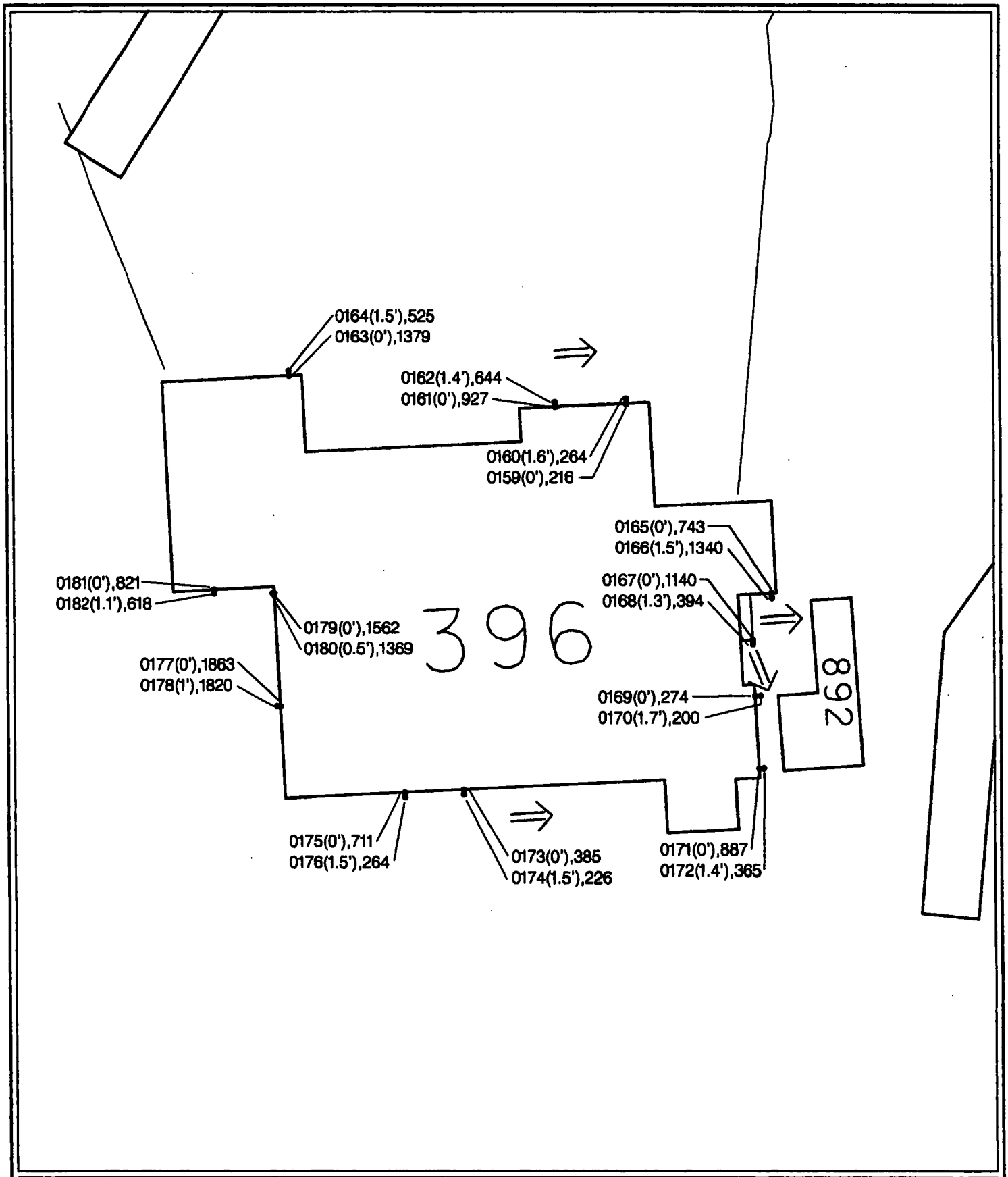
Field Sampling Plan
Mare Island

FIGURE

7

WESTON MANAGERS DESIGNERS/CONSULTANTS

pfsdir/marelsle/fig7.dgn 12-16-1998



0 20 40

Scale In Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

Field Sampling Plan
Mare Island

FIGURE

8

WESTON

MANAGERS DESIGNERS/CONSULTANTS

pfsdir/mareisle/fig8.dgn 12-16-1998

997

WALNUT AVENUE

0410(2.8'),388
0409(0'),331

0412(3.6'),301
0411(0'),400

0414(3.1'),260
0413(0'),7945

0416(2.8'),161
0415(0'),192

0418(2.4'),950
0417(0'),1355

0420(3.1'),172
0419(0'),1034

0422(3.3'),146
0421(0'),798

0424(2.6'),158
0423(0'),1767

0426(2.6'),201
0425(0'),189

0428(2.8'),295
0427(0'),930

0430(3.2'),256
0429(0'),576

571

0402(0'),374
0403(3.4'),165

0406(0'),1626
0407(0.9'),161

0400(0'),479
0401(2.3'),201

0404(0'),188
0405(1.2'),136

0408(1.2'),1830

0 25 50
Scale in Feet

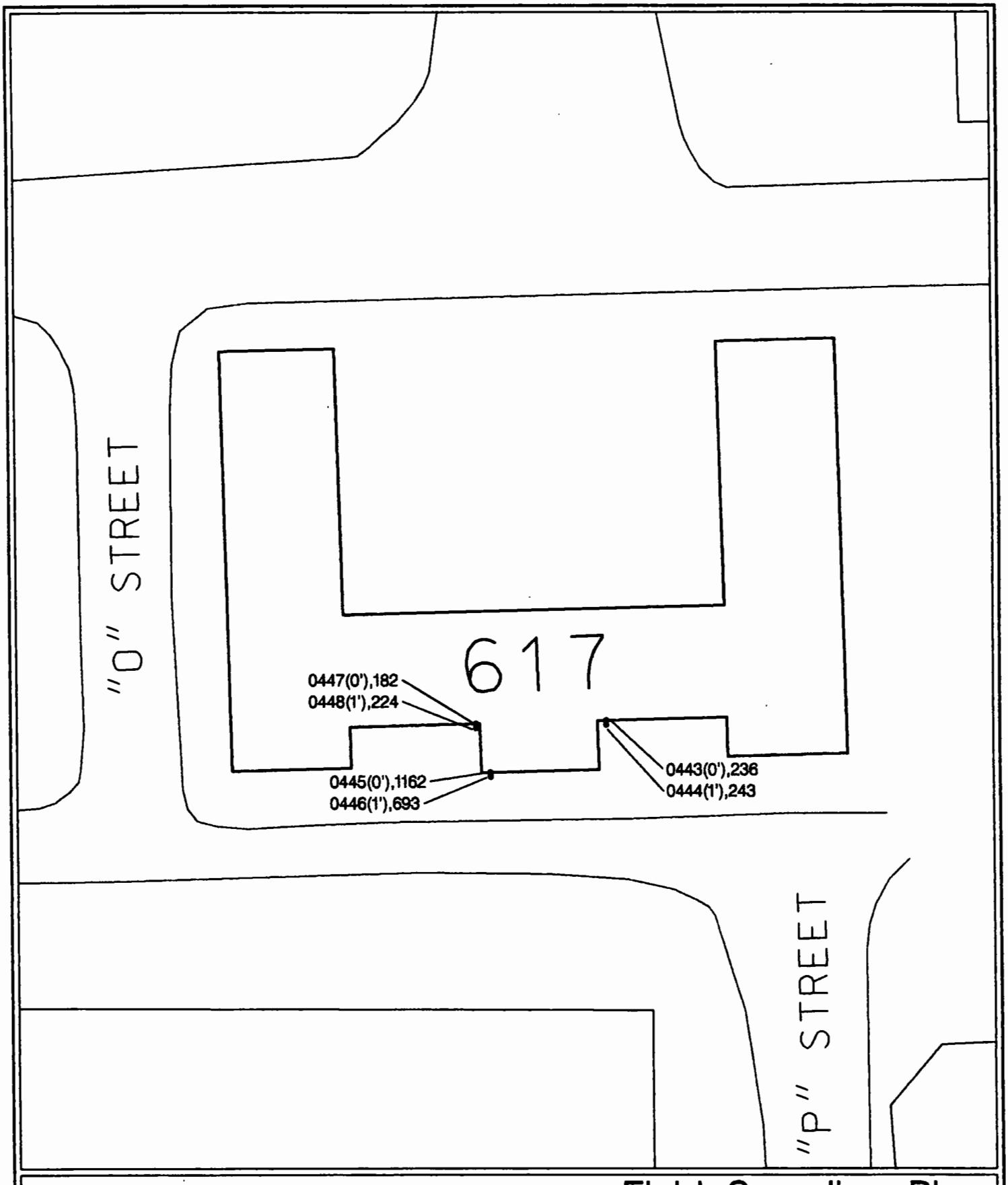
0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
9

nfsdir/mareisle/fig9.dgn 12-16-1998

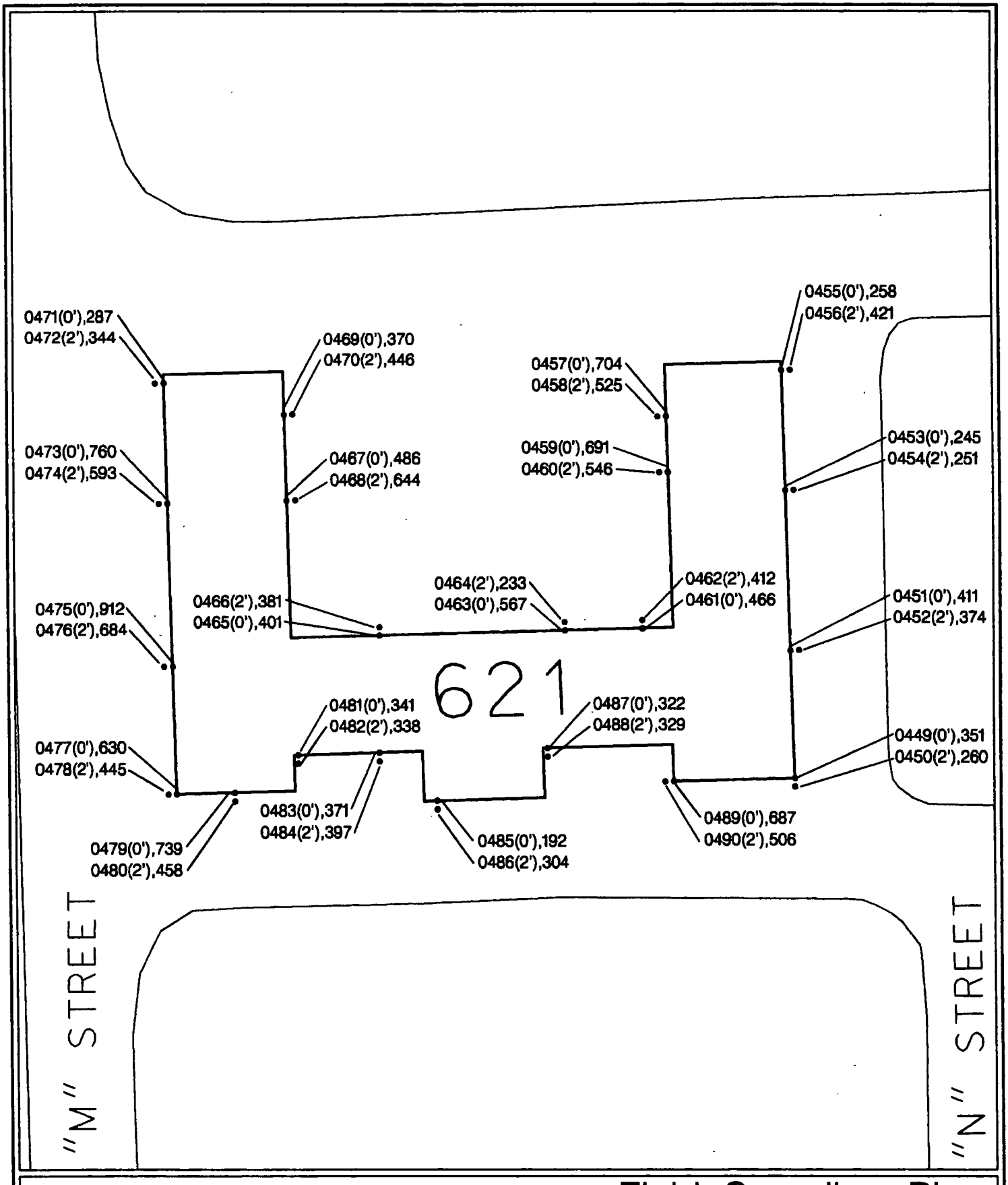


Field Sampling Plan
Mare Island

FIGURE
10

WESTON
MANAGERS CONSULTANTS

pfsdir/mareisle/fig10.dgn 12-16-1998



0 15 30
Scale In Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

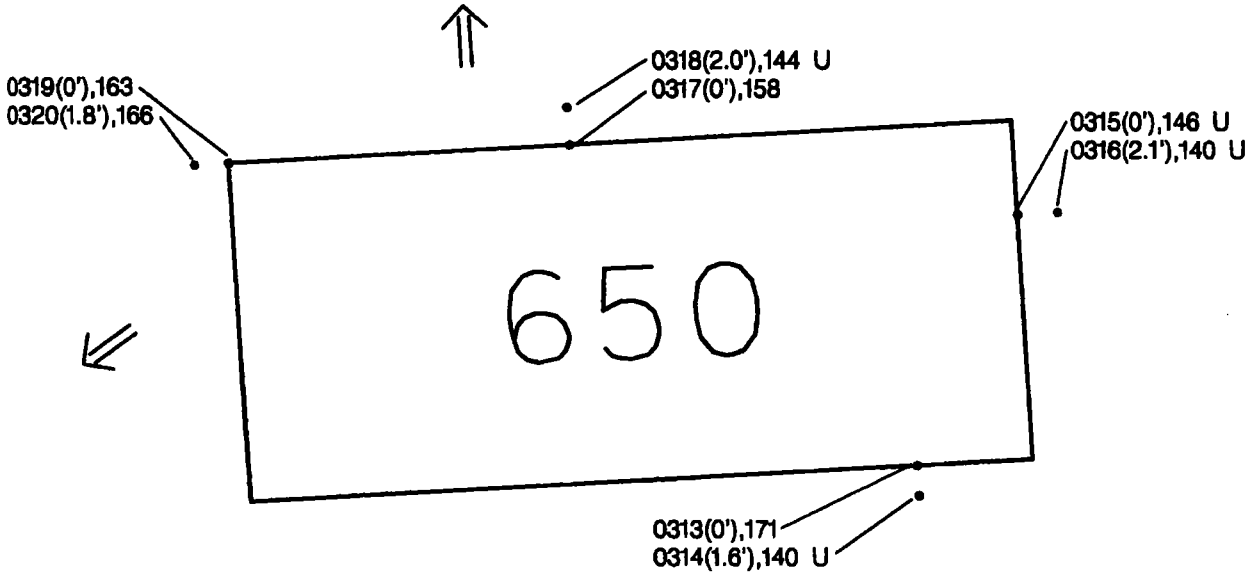
Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
11

WESTON
MANAGERS DESIGNERS/CONSULTANTS

pfsdir/mareisle/fig11.dgn 12-16-1998



0 5 10
Scale In Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

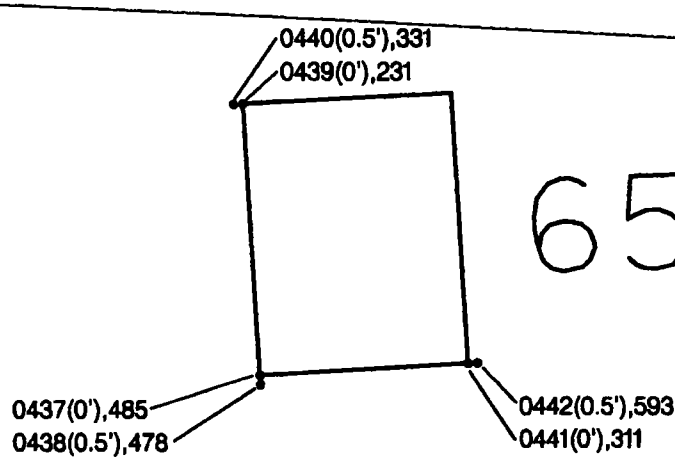
U Not detected above method quantitation limit

Field Sampling Plan
Mare Island

FIGURE
2

WESTON MANAGERS ENGINEERS/CONSULTANTS

pfsdir/mareisle/fig12.dgn 12-16-1998



0 5 10
Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

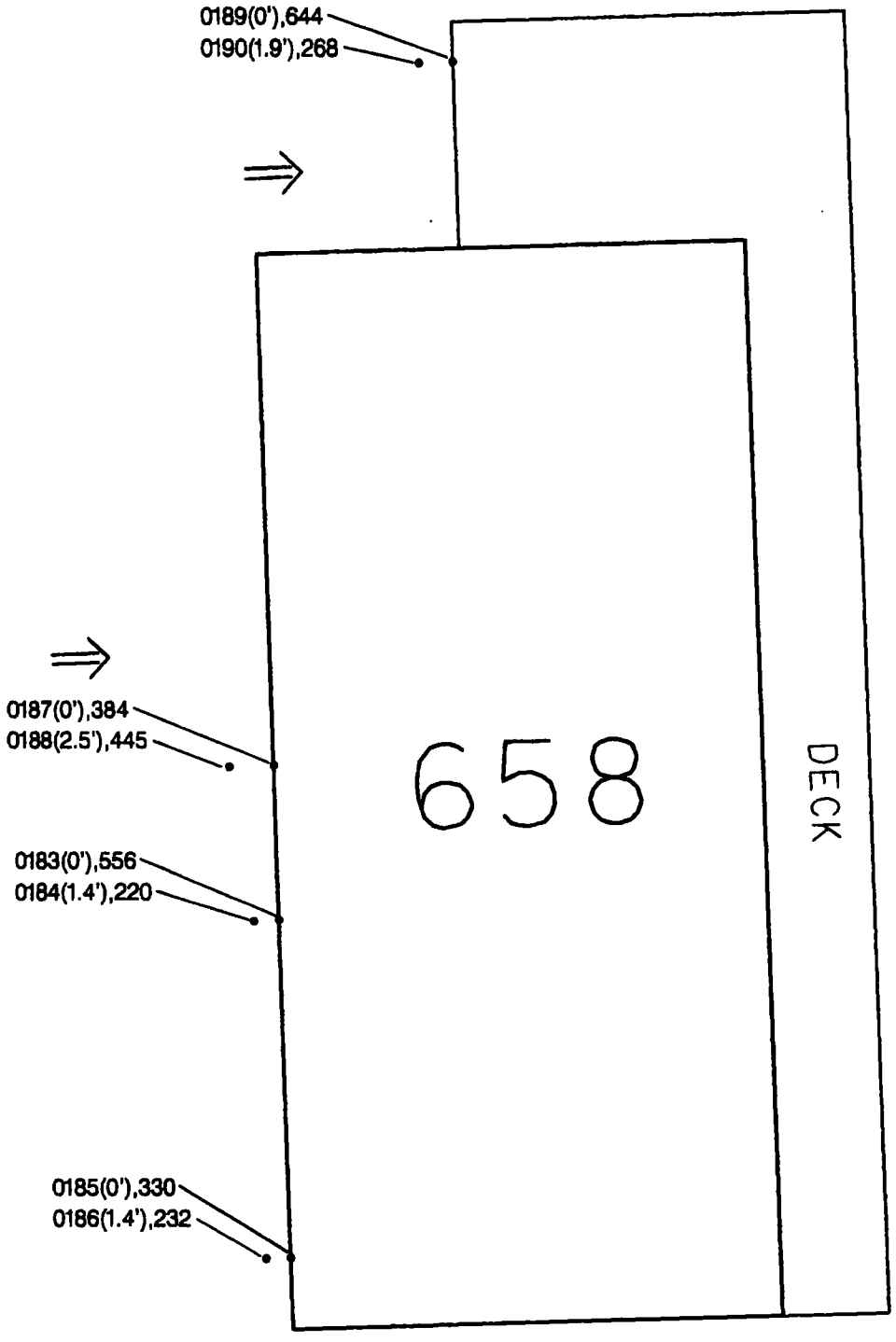
Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
13

WESTON MANAGERS CONSULTANTS

pfsdir/mareisle/fig13.dgn 12-16-1998



0 5 10
Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

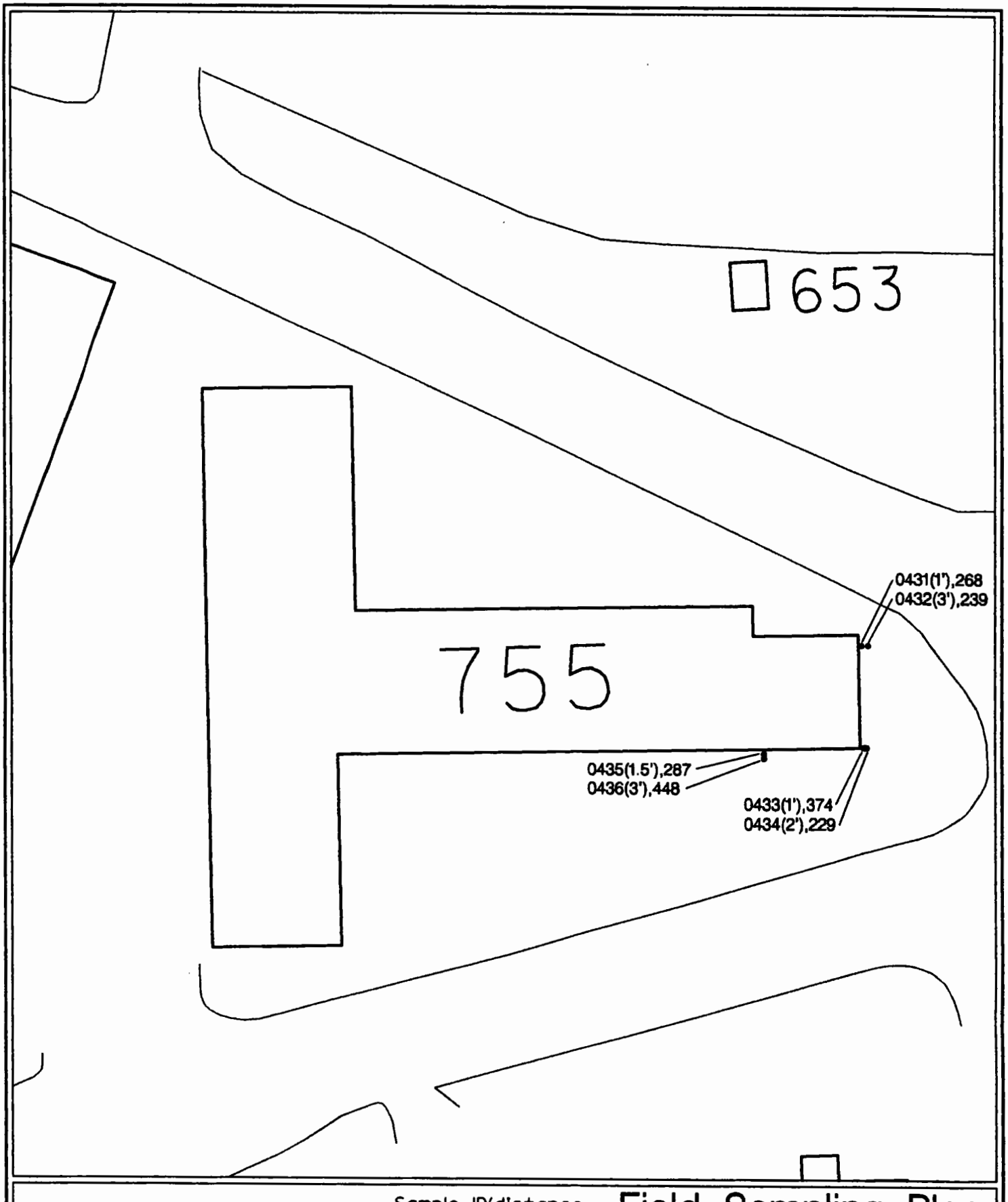
Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
4

WESTON
MANAGERS DESIGNERS/CONSULTANTS

pfedir/mareisle/fig14.dgn 12-16-1998



0 20 40
Scale in Feet

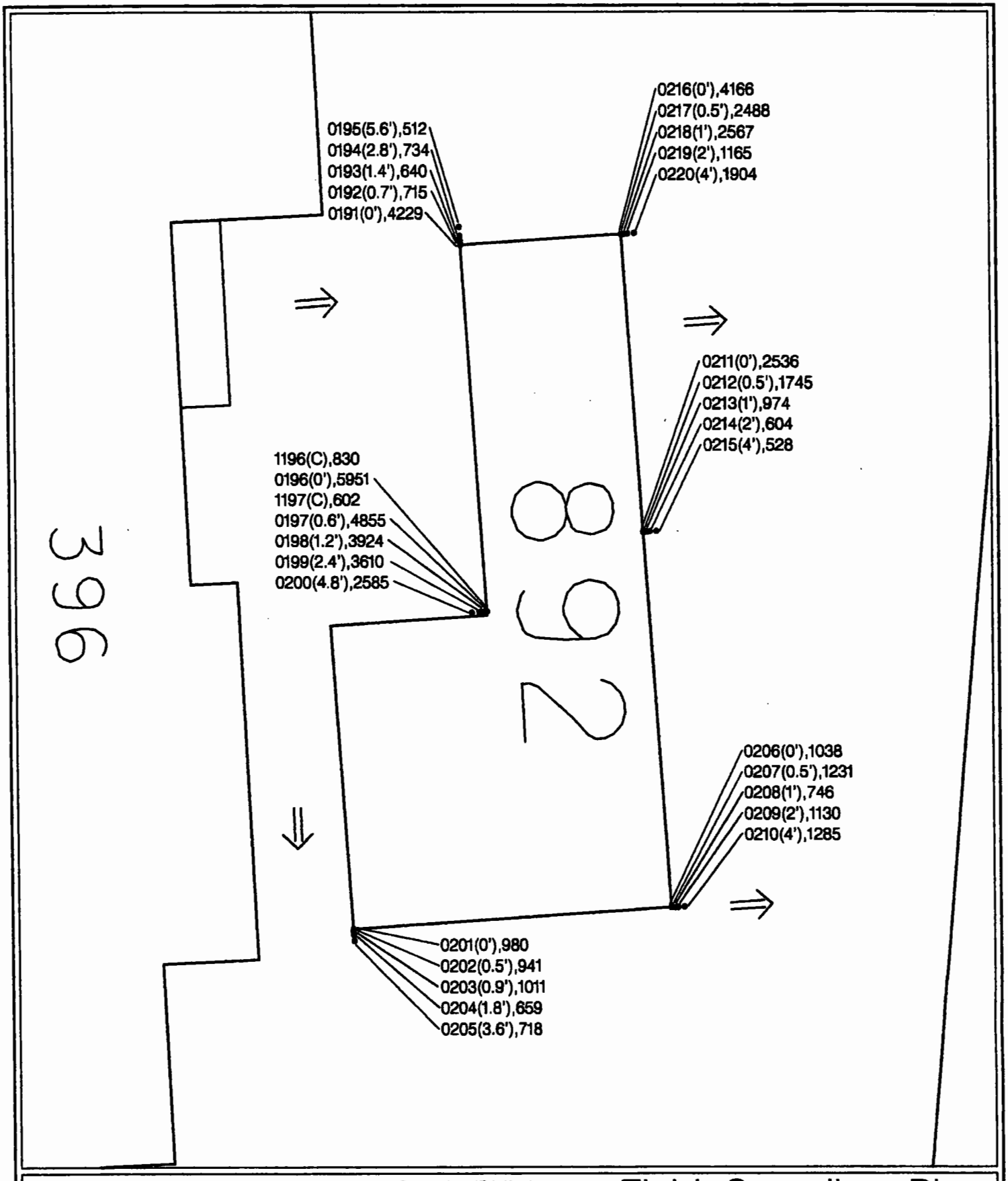
0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

Field Sampling Plan
Mare Island

FIGURE
5

WESTON
MANAGERS ENGINEERS/CONSULTANTS

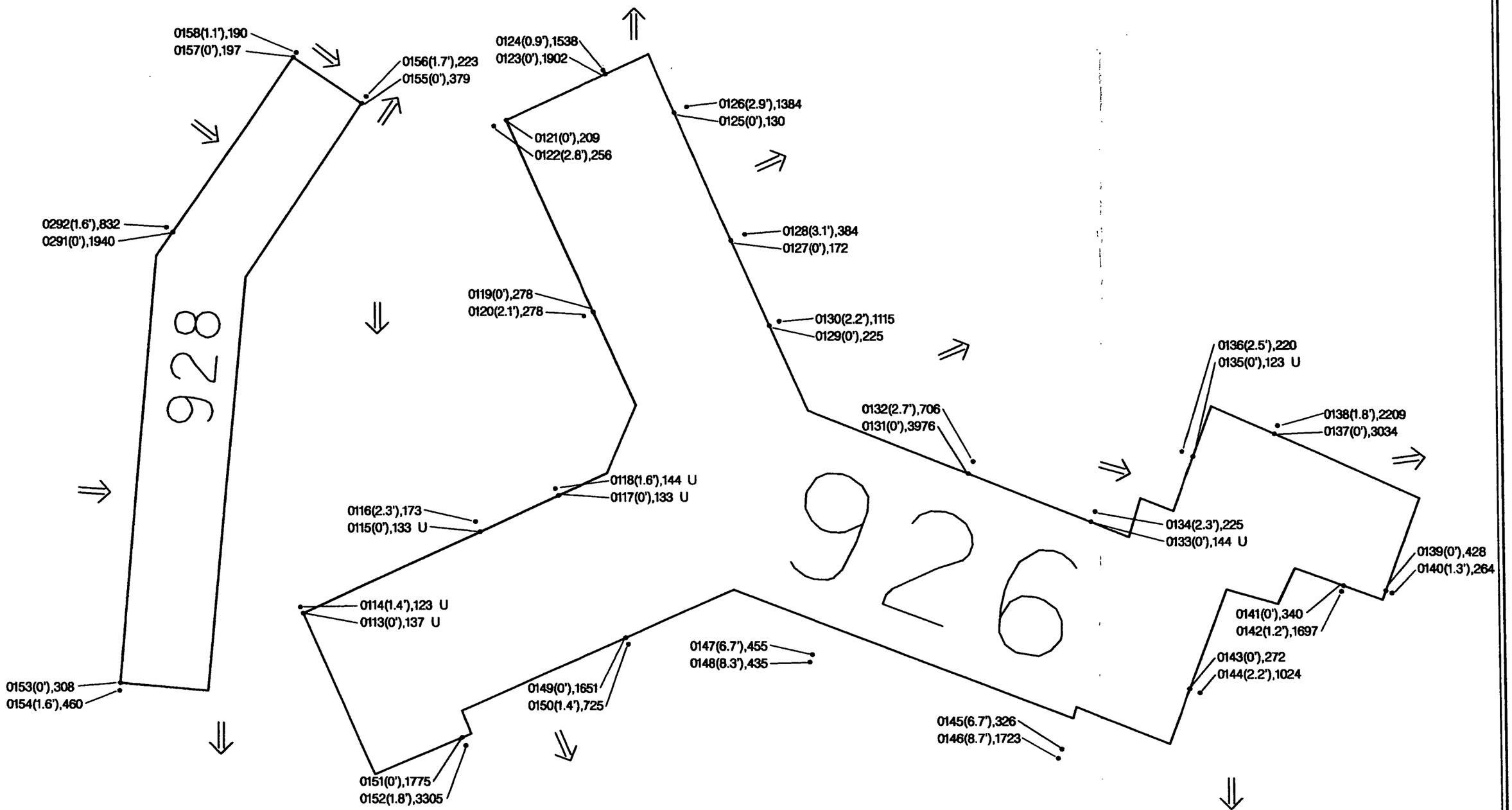


Field Sampling Plan
Mare Island

FIGURE

6

WESTON



0 10 20
Scale in Feet

0152(2'),321 • Sample ID(distance from building),LBP Concentration

Drainage Flow

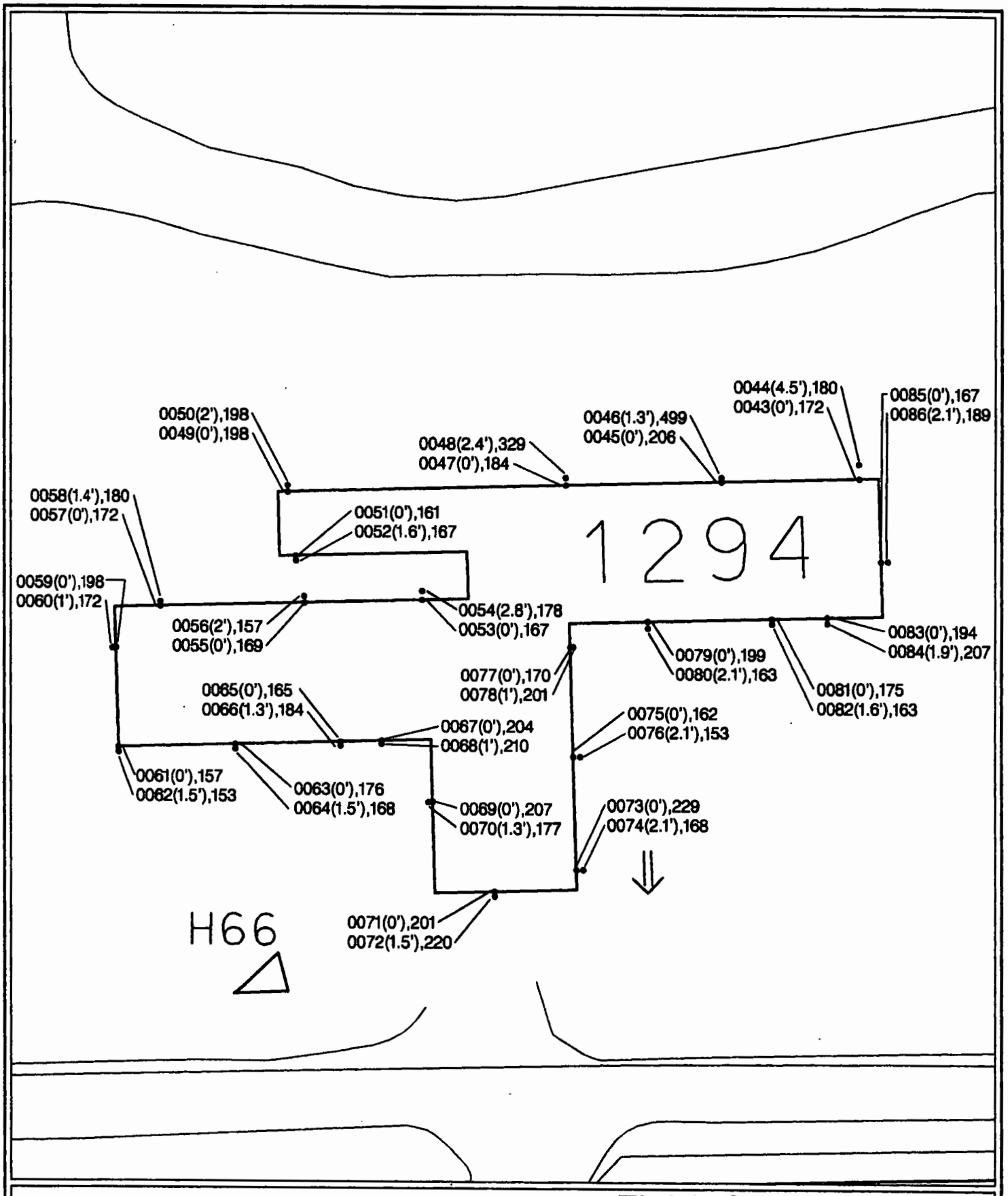
U Not detected above method quantitation limit

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Field Sampling Plan
Mare Island

FIGURE
7

nfsdir/mareisle/fig17.dgn 12-16-1998



Field Sampling Plan
Mare Island

FIGURE
18

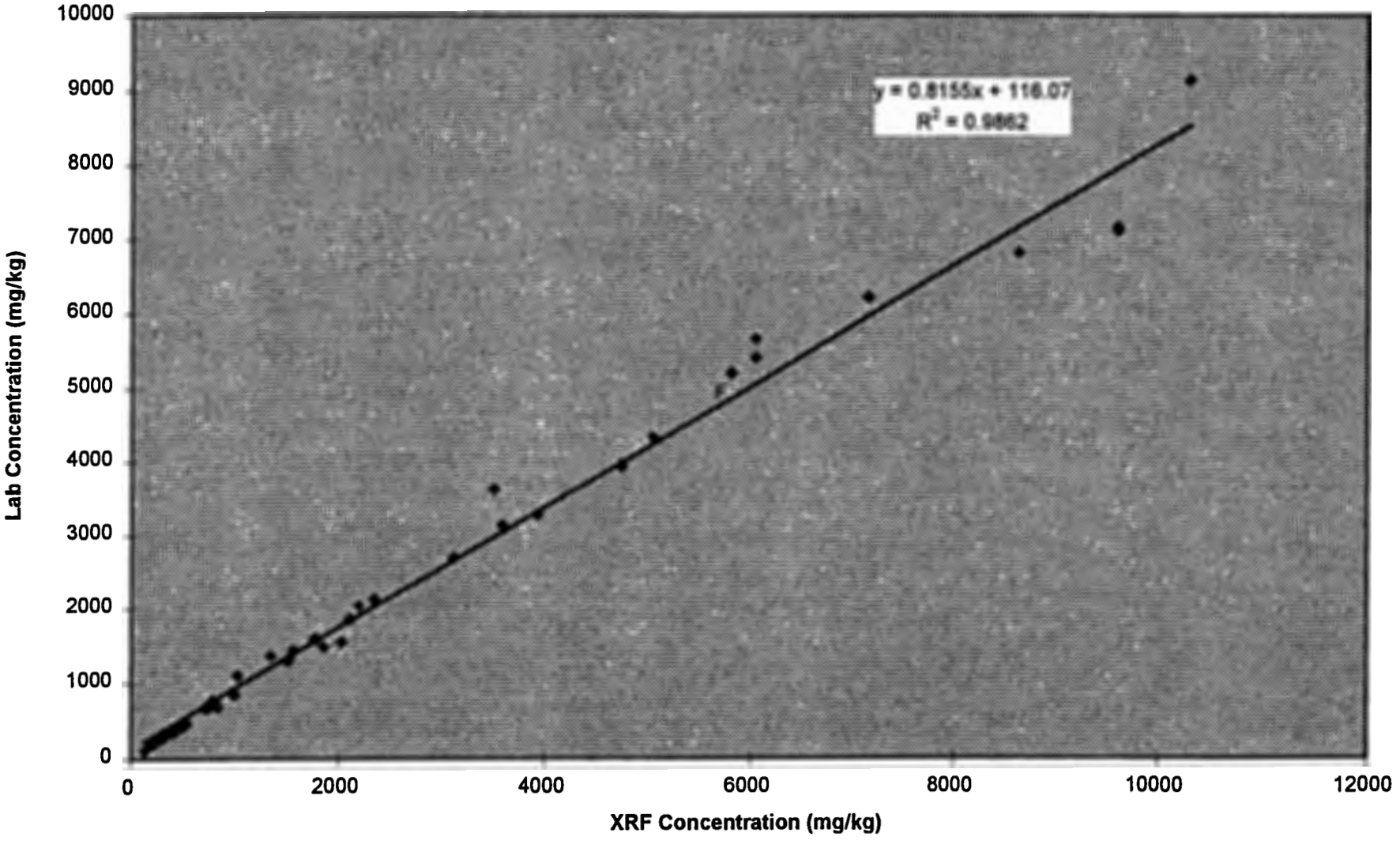

Mare Island Lab vs XRF Lead Concentration
y = 0.8155x + 116.07
R² = 0.9862
Lab Concentration (mg/kg)
XRF Concentration (mg/kg)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
0
2000
4000
6000
8000
10000
12000

FIGURE 19

APPENDIX A

DATA EVALUATION REPORT

Roy F. Weston, Inc.
Suite 1580
2300 Clayton Road
Concord, California 94520-2148
925-603-7900 • Fax 925-603-7901

MANAGERS DESIGNERS/CONSULTANTS

MEMORANDUM

DATE: 17 December 1998

TO: Michael Work, WAM, U.S. EPA, Region IX

FROM: Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Quality Assurance Review of Lead Data
Laboratory Batch 135292
Site: Mare Island

WORK ASSIGN NO.: 46-35-9379

DOC. CONTROL NO.: 4900-006-021-AAAS

WORK ORDER NO.: 4900-006-021-4300-00

cc: Joe Eidelberg, QA Branch, U.S. EPA, Region 9
Karla Brasaemle, Project Manager, WESTON

The quality assurance review of 47 confirmation samples, laboratory batch 135292, collected from Mare Island has been completed. The 43 soil and 4 water samples were analyzed for lead by Quanterra Incorporated, of Santa Ana, California. The samples were numbered

002	007	009	018	025
028	034	092	096	102
105	123	131	137	150
173	179	191	196	197
215	224	238	263	265
267	268	277	278	283
285	406	408	413	417
421	423	429	437	473
908	909	910	LB-01	LB-02
LB-03	LB-04			

Samples LB-01, LB-02, LB-03, and LB-04 were field laboratory preparation/rinsate blank samples. Samples 908, 909, and 910 were "blind" duplicate samples submitted to the laboratory.

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control specifications outlined in the laboratory subcontract technical specifications. The review follows the format as described in the U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA OSWER 9240.1-05-01, February 1994).

1. Holding Times

   All samples met holding time criteria.

2. Calibration

   a. Initial Calibration

      Initial calibration frequencies and QC criteria were met.

   b. CRI/CRA Standards

      Instrument calibration near the detection limit was verified and met recovery criteria.

   c. Initial and Continuing Calibration Verification

      All inductively coupled plasma (ICP) results met control limits of 90 to 110 percent recovery (percent R) of the true values for both initial and continuing calibration.

3. Instrument Detection Limits

   All instrument detection limits (IDL) for ICP analyses are equal to or less than the required detection limits.

4. Blanks

   a. Laboratory Method Blanks

      No analytes were detected in laboratory method blanks.

   b. Initial Calibration and Continuing Calibration Blanks

      No analytes were detected in calibration blanks.

   c. Field Blanks

      Samples LB-01, LB-02, LB-03, and LB-04 were field laboratory preparation/rinsate blank samples. Lead was detected in blank sample LB-01 at 0.0056 mg/L. Assuming the worst case, i.e. that all lead in the one liter blank sample were incorporated into a soil sample (1 gram analyzed by the lab), would result in a soil blank contamination level of 5.6 mg/kg. No confirmation laboratory data required qualification since all reported lead concentrations were greater than five times the blank concentration (adjusted to a soil basis).

5. ICP Interference Check

   All analytes for the interference check samples were within the control limits of 80 to 120 percent of the true values.

6. Laboratory Control Sample

   The recoveries for all analytes for ICP analysis were within the control limits of 80 to 120 percent for water and within control limits of 80 to 115 percent for soil.

7. Laboratory Duplicate Sample Analysis

   All relative percent differences (RPD) between analytical results were within the QC limit of 35 percent (or $\pm$ 2 times the detection limit for concentrations < 5 times the detection limit) for soil and 20 percent ($\pm$the detection limit for concentrations < 5 times the detection limit) for water samples.

8. Spiked Sample Analysis

   Matrix spike recoveries and relative percent differences were not calculated by the laboratory since the lead concentration in the three samples selected for matrix spike analysis was greater than 5 times the spiking concentration.

9. ICP Serial Dilution

   The percent differences (percent D) for ICP serial dilution analysis were within the QC limits of 10 percent for all parameters.

10. Furnace AA QC

    Furnace AA analysis was not required. ICP detection limits were sufficiently low to meet project objectives.

11. Field Duplicate Analysis

The following four samples were submitted to the laboratory as "blind" duplicates.

Sample/Replicate Number	Sample Concentration (mg/kg)	Replicate Concentration (mg/kg)	Relative Percent Difference
131/909	3960	3930	0.76 %
413/908	7110	7150	0.56 %
263/910	1300	1320	1.53 %

Field duplicate results met criteria of less than 35 % rpd.

12. Standard Reference Material (SRM) Analysis

No SRMs were submitted with this batch of samples. Laboratory results for paint and soil SRMs submitted with batch 133358 (Moffett Field samples) were within the 95% confidence limits.

13. Laboratory Contact

Sample 909 was mis-identified by the laboratory as sample 907. Sample 427 was mis-identified by the laboratory as sample 429 on the chain of custody form though it was noted that sample 427 was received. The laboratory results pages have been corrected by the reviewer.

Data Assessment

The usefulness of the data is based on the criteria outlined in the U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (OSWER 9240.1-05-01).

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the CRDL or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 002
LAB ID: 135292-0011-SA
Matrix: SOIL — Sampled: 02 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	5660		2.0	0.62	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 3.0%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 007
LAB ID: 135292-0012-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 02 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	2690		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

RHM
12/8/98

Percent moisture is 2.6%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 009
LAB ID: 135292-0013-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 02 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1110		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

KMM
12/8/98

Percent moisture is 3.0%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 018
LAB ID: 135292-0014-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 02 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1450		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

rnn
12/8/98

Percent moisture is 1.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 025
LAB ID: 135292-0015-SA
Matrix: SOIL — Sampled: 02 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	3270		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

Percent moisture is 2.6%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 028
LAB ID: 135292-0016-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 02 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	9130		2.0	0.62	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 3.7%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 034
LAB ID: 135292-0017-SA
Matrix: SOIL — Sampled: 02 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	474		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 1.8%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 092
LAB ID: 135292-0018-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 03 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	194		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 3.6%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 096
LAB ID: 135292-0019-SA
Matrix: SOIL — Sampled: 03 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	3620		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

RHM
12/8/98

Percent moisture is 1.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 102
LAB ID: 135292-0020-SA
Matrix: SOIL — Sampled: 03 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	2120		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

JEWS
12/8/98

Percent moisture is 2.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 105
LAB ID: 135292-0001-SA
Matrix: SOIL — Sampled: 03 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1370		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 1.4%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 123
LAB ID: 135292-0002-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 04 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	2040		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 1.8%. All results and limits are reported on a dry weight basis.

METALS

Client Name:	Roy F. Weston Inc.		
Client ID:	131		
LAB ID:	135292-0003-SA		
Matrix:	SOIL	Sampled: 04 NOV 98	Received: 20 NOV 98
Authorized:	20 NOV 98	Prepared: See Below	Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	3960		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 2.2%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 137
LAB ID: 135292-0005-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 04 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	3130		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 4.3%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 150
LAB ID: 135292-0004-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 04 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	683		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

JRH
12/8/98

Percent moisture is 1.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 173
LAB ID: 135292-0006-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 05 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	304		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

RHM
12/8/98

Percent moisture is 1.3%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 179
LAB ID: 135292-0007-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 05 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1600		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

JRHm
12/8/98

Percent moisture is 1.5%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 191
LAB ID: 135292-0008-SA
Matrix: SOIL — Sampled: 06 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	4330		1.0	0.32	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 5.3%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 196
LAB ID: 135292-0009-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 06 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	6210		2.0	0.61	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 2.1%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 197
LAB ID: 135292-0010-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 06 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	5200		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

RHM
12/8/98

Percent moisture is 2.6%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 215
LAB ID: 135292-0030-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 06 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	435		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.1%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 224
LAB ID: 135292-0029-SA
Matrix: SOIL — Sampled: 06 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	5400		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

KHH
12/8/98

Percent moisture is 2.1%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 238
LAB ID: 135292-0028-SA
Matrix: SOIL — Sampled: 09 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	6810		2.0	0.60	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 0.7%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 263
LAB ID: 135292-0027-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1300		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 0.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 265
LAB ID: 135292-0026-SA
Matrix: SOIL — Sampled: 09 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	357		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.5%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 267
LAB ID: 135292-0025-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	468		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.0%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 268
LAB ID: 135292-0024-SA
Matrix: SOIL — Sampled: 09 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	668		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.0%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 277
LAB ID: 135292-0031-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	371		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/18/98

Percent moisture is 2.5%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 278
LAB ID: 135292-0032-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	283		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.8%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 283
LAB ID: 135292-0033-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	204		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/18/98

Percent moisture is 3.3%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 285
LAB ID: 135292-0034-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 09 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	108		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

jkm
12/8/98

Percent moisture is 4.2%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 406
LAB ID: 135292-0039-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 13 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1480		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 2.7%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 408
LAB ID: 135292-0040-SA
Matrix: SOIL — Sampled: 13 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1860		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 3.2%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 413
LAB ID: 135292-0041-SA
Matrix: SOIL — Sampled: 13 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	7110		2.0	0.61	mg/kg	6010B	20 NOV 98	25 NOV 98

12/18/98

Percent moisture is 1.2%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 417
LAB ID: 135292-0045-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 13 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1330		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 0.7%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 421
LAB ID: 135292-0042-SA
Matrix: SOIL — Sampled: 13 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	697		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 0.7%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 423
LAB ID: 135292-0046-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 13 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1550		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

RTM
12/18/98

Percent moisture is 1.0%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 437
LAB ID: 135292-0044-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 14 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	389		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

12/18/98

Percent moisture is 3.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 427
LAB ID: 135292-0049-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 20 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	851		1.0	0.30	mg/kg	6010B	20 NOV 98	21 NOV 98

12/8/98

Percent moisture is 0.9%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 473
LAB ID: 135292-0048-SA
Matrix: SOIL — Sampled: 14 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	767		1.0	0.31	mg/kg	6010B	20 NOV 98	21 NOV 98

KKM
12/8/98

Percent moisture is 3.3%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 908
LAB ID: 135292-0043-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 13 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	7150		2.0	0.61	mg/kg	6010B	20 NOV 98	25 NOV 98

RMM
12/8/98

Percent moisture is 1.1%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: ~~907~~ 909 7km
LAB ID: 135292-0021-SA
Matrix: SOIL
Authorized: 20 NOV 98

Sampled: 04 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	3930		1.0	0.31	mg/kg	6010B	20 NOV 98	23 NOV 98

7km
12/8/98

Percent moisture is 1.8%. All results and limits are reported on a dry weight basis.

METALS

Client Name: Roy F. Weston Inc.
Client ID: 910
LAB ID: 135292-0036-SA
Matrix: SOIL — Sampled: 13 NOV 98 — Received: 20 NOV 98
Authorized: 20 NOV 98 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	1320		1.0	0.30	mg/kg	6010B	20 NOV 98	23 NOV 98

12/8/98

Percent moisture is 1.0%. All results and limits are reported on a dry weight basis.

METALS
(Water)

Client Name: Roy F. Weston Inc.
Client ID: LB-01
LAB ID: 135292-0022-SA
Matrix: WATER-QA
Authorized: 20 NOV 98

Sampled: 06 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	0.0056		1.0	0.0030	mg/L	6010B	20 NOV 98	21 NOV 98

12/8/98

METALS
(Water)

Client Name: Roy F. Weston Inc.
Client ID: LB-02
LAB ID: 135292-0023-SA
Matrix: WATER-QA
Authorized: 20 NOV 98

Sampled: 06 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	ND		1.0	0.0030	mg/L	6010B	20 NOV 98	21 NOV 98

12/8/98

ND = Not Detected

METALS
(Water)

Client Name: Roy F. Weston Inc.
Client ID: LB-03
LAB ID: 135292-0037-SA
Matrix: WATER-QA
Authorized: 20 NOV 98
Sampled: 17 NOV 98
Prepared: See Below
Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	ND		1.0	0.0030	mg/L	6010B	20 NOV 98	21 NOV 98

12/8/98

ND = Not Detected

METALS
(Water)

Client Name: Roy F. Weston Inc.
Client ID: LB-04
LAB ID: 135292-0038-SA
Matrix: WATER-QA
Authorized: 20 NOV 98

Sampled: 17 NOV 98
Prepared: See Below

Received: 20 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Lead	ND		1.0	0.0030	mg/L	6010B	20 NOV 98	21 NOV 98

prcm
12/18/98

ND = Not Detected

APPENDIX B

STATISTICAL EVALUATION

Mare Island Lead Based Paint Survey
Building H-1 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
912
2333
2750
4534
4806
4982
5312
6096
6317
8627
10400
10900
11100
11200
11700
12500
13800
13900
14500
15200
16200
16200
17500

Number of samples	23	Uncensored values	
Uncensored	23	Mean	9642.13
Censored	0	Lognormal mean	10427.61
Detection limit or PQL	50	Std. devn.	4993.29005
Method detection limit		Median	10900
TOTAL	23	Min.	912
		Max.	17500

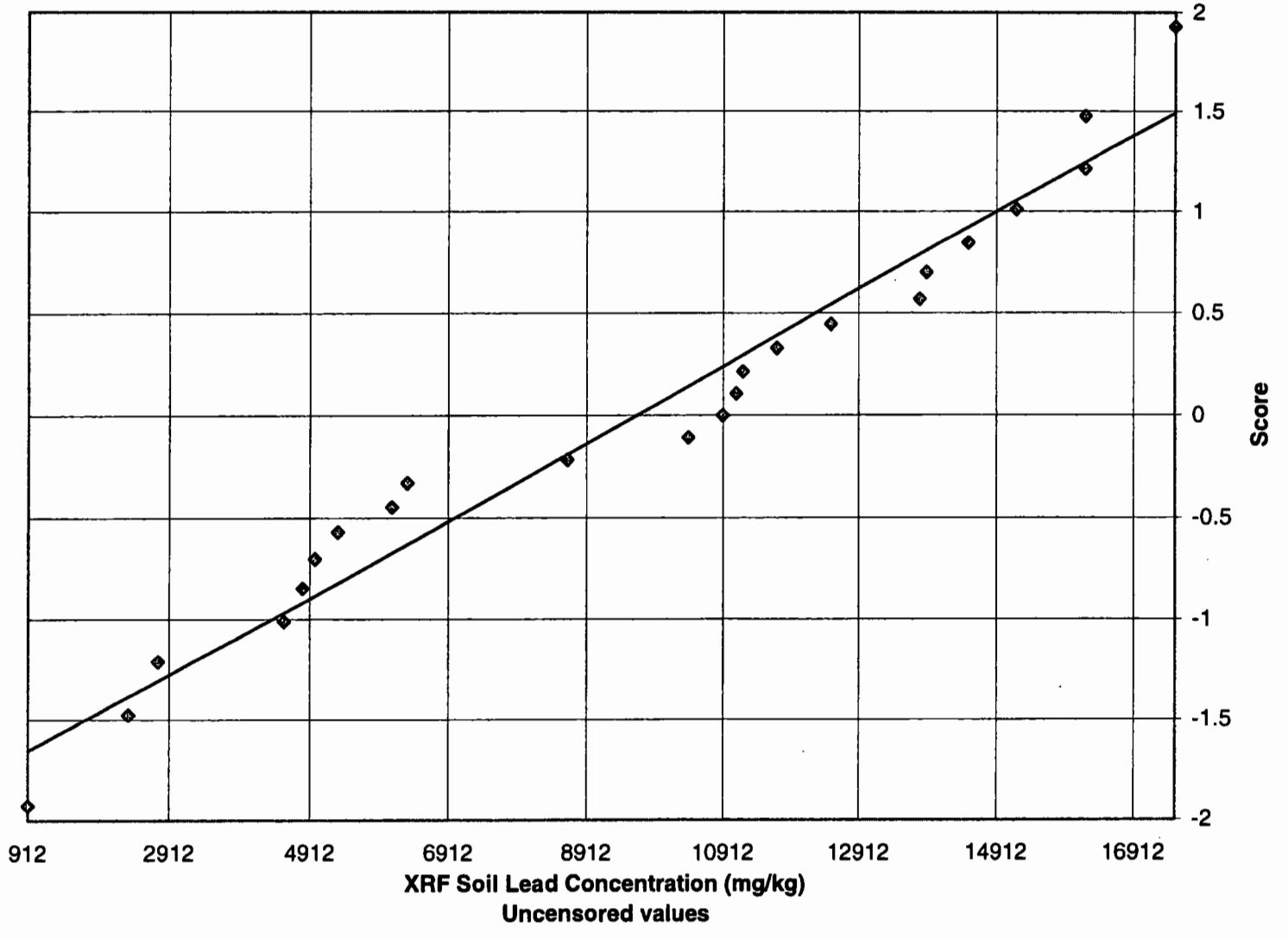
Lognormal distribution?		Normal distribution?	
r-squared is:	0.864	r-squared is:	0.960

Recommendations:
Reject lognormal distribution.
W value is 0.8661. This is less than the tabled value of 0.914
Assume normal distribution.
W value is 0.9461. This exceeds the tabled value of 0.914

UCL (based on t-statistic) is 11429.82

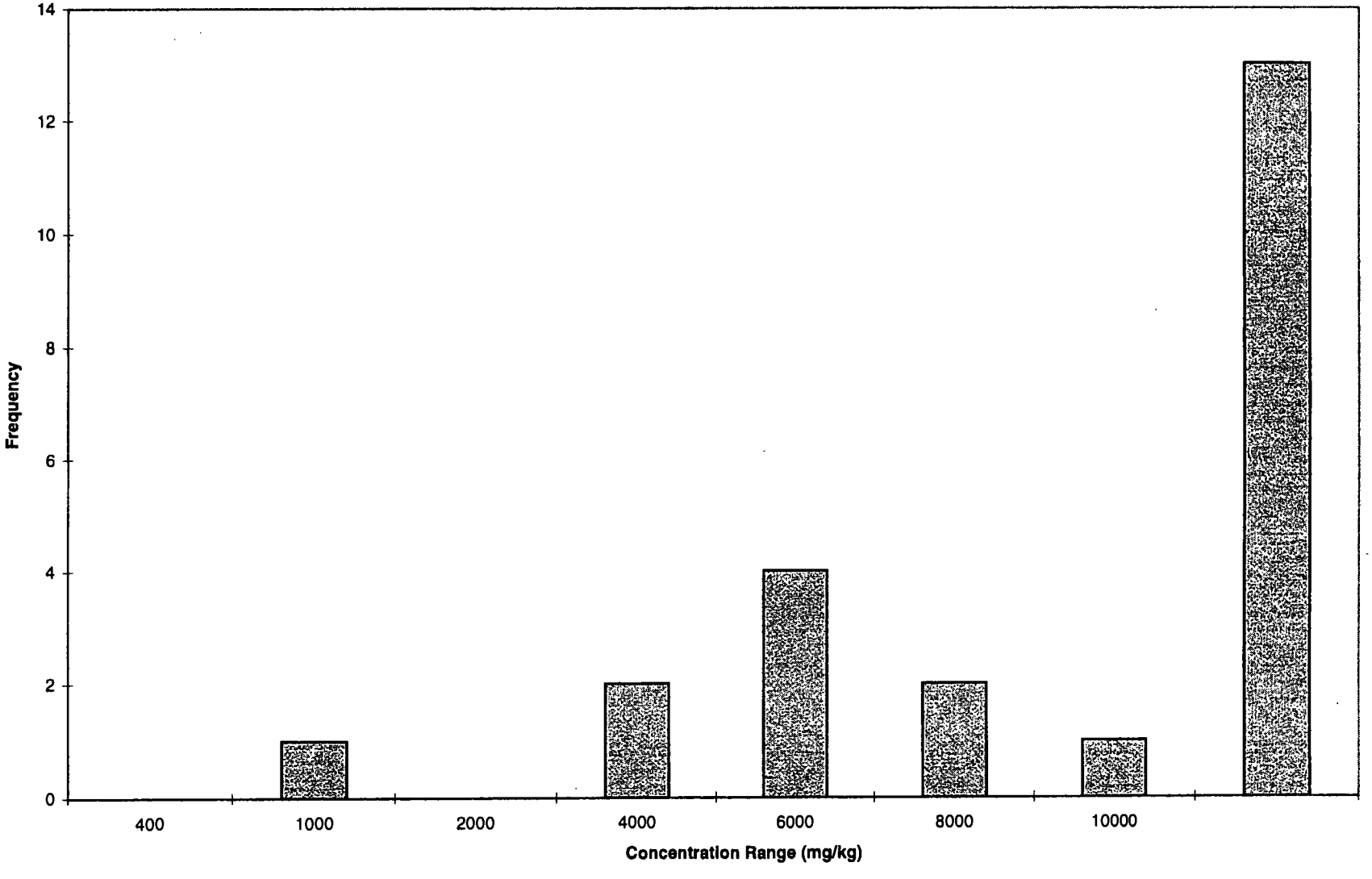
Mare Island Lead Based Paint Survey
Building H-1 XRF Soil Lead

Normal probability plot (NORMAL CASE)



H1XRFPT.XLS

Mare Island Lead Based Paint Survey
Building H-1 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-1 Predicted Laboratory Soil Lead Summary Statistics

Calc Conc (mg/kg)
859.81
2018.6
2358.7
3813.5
4035.4
4178.9
4448
5087.4
5267.6
7151.4
8597.3
9005
9168.1
9249.7
9657.4
10310
11370
11452
11941
12512
13327
13327
14387

Number of samples	23	Uncensored values	
Uncensored	23	Mean	7979.23
Censored	0	Lognormal mean	8550.91
Detection limit or PQL	50	Std. devn.	4072.02804
Method detection limit		Median	9005.02
TOTAL	23	Min.	859.806
		Max.	14387.32

Lognormal distribution?		Normal distribution?	
r-squared is:	0.871	r-squared is:	0.960

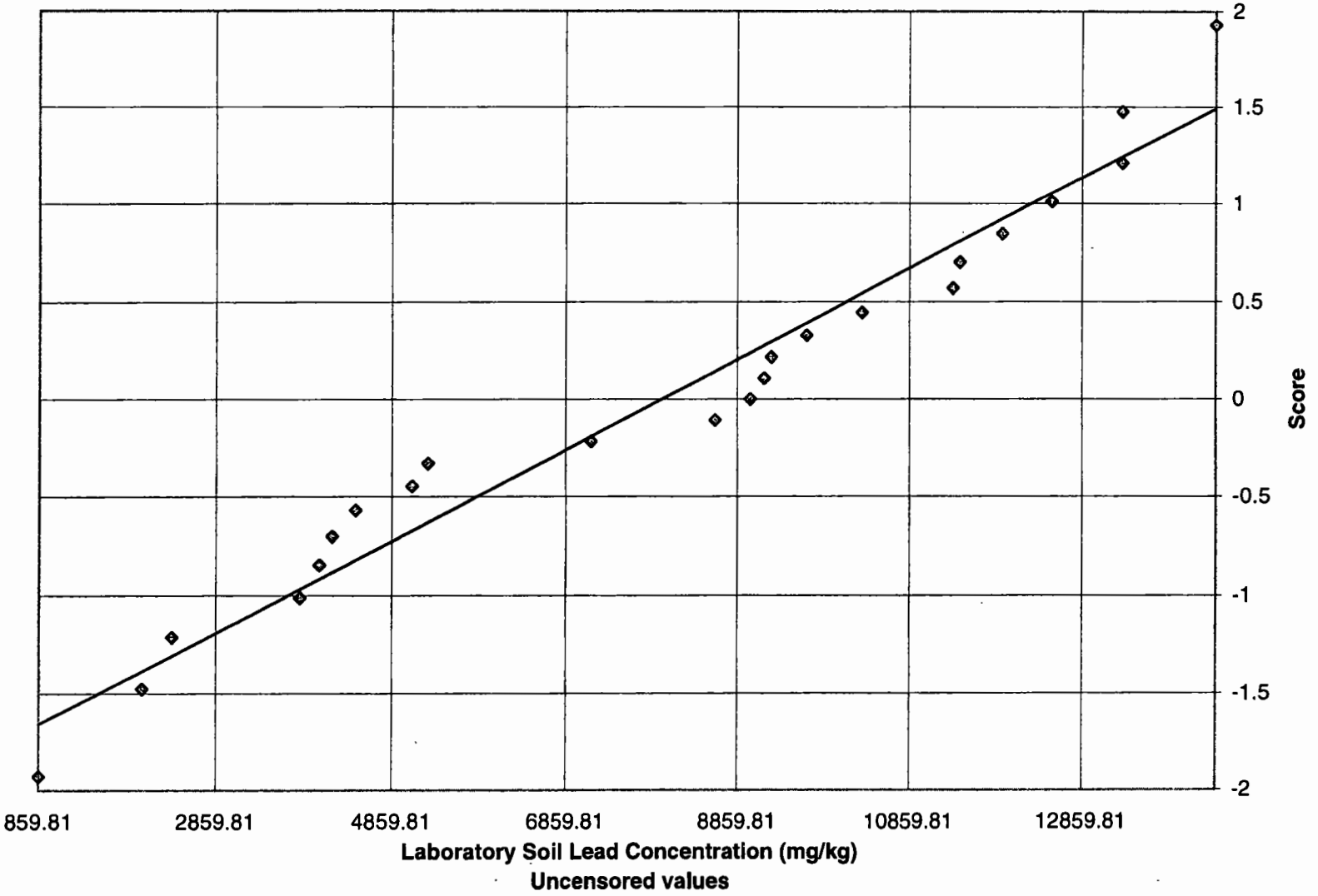
Recommendations:
Reject lognormal distribution.
W value is 0.8727. This is less than the tabled value of 0.914
Assume normal distribution.
W value is 0.9461. This exceeds the tabled value of 0.914

UCL (based on t-statistic) is 9437.09

Laboratory concentration calculated from regression equation

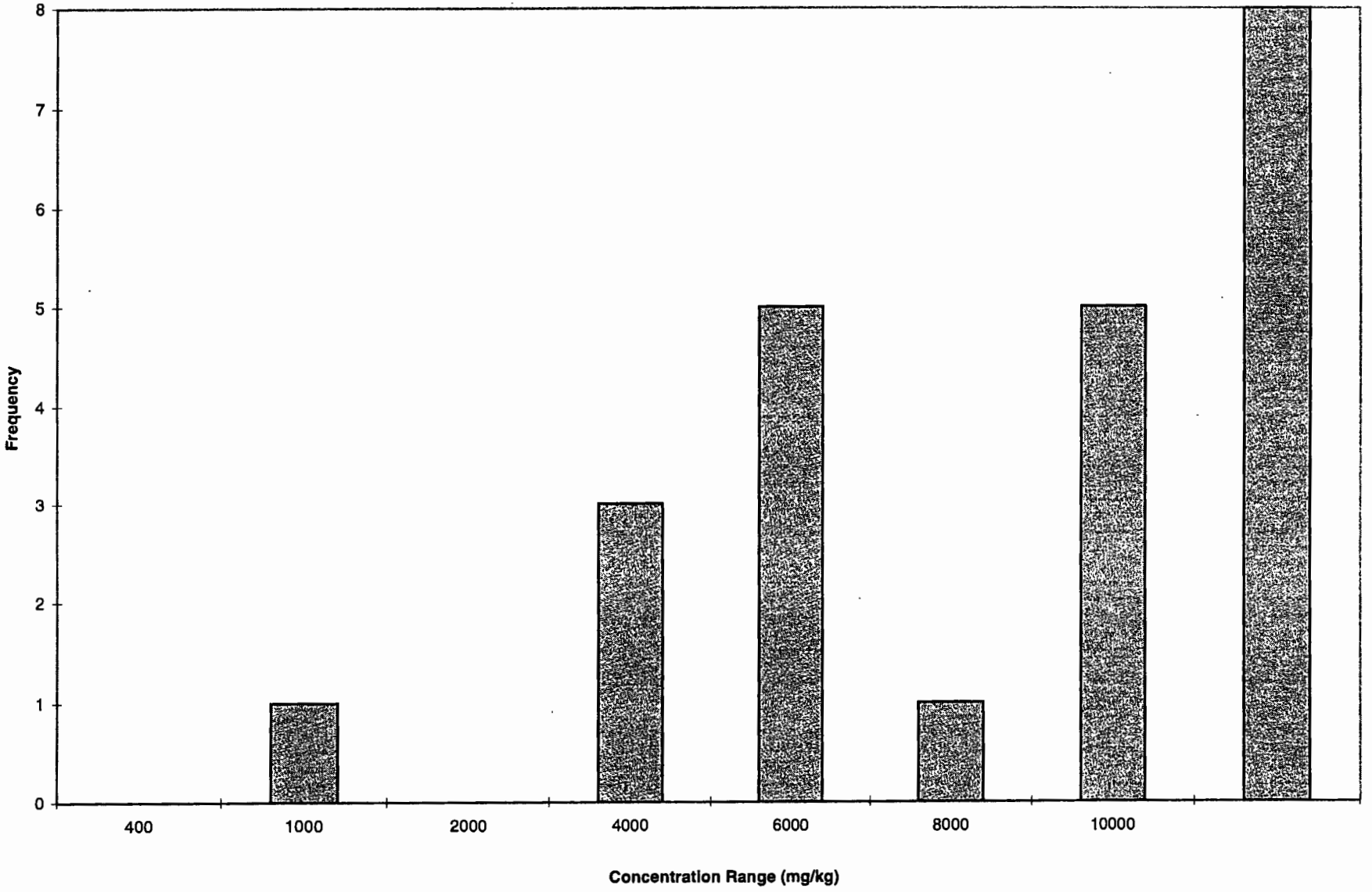
Mare Island Lead Based Paint Survey
Building H-1 Predicted Laboratory Soil Lead

Normal probability plot (NORMAL CASE)



H1LABPT.XLS

Mare Island Soil Lead Survey
Building H-1 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-71 XRF Soil Lead Summary Statistics

Conc (mg/kg)
54
208
213
293
304
321
379
480
524
678
683
746
747
881
895
944
1135
1258
1345
1870
1910
2336
2645
3290
3494
5971

Number of samples	26	Uncensored values	
Uncensored	26	Mean	1292.46
Censored	0	Lognormal mean	1399.01
Detection limit or PQL	50	Std. devn.	1342.55468
Method detection limit		Median	814
TOTAL	26	Min.	54
		Max.	5971

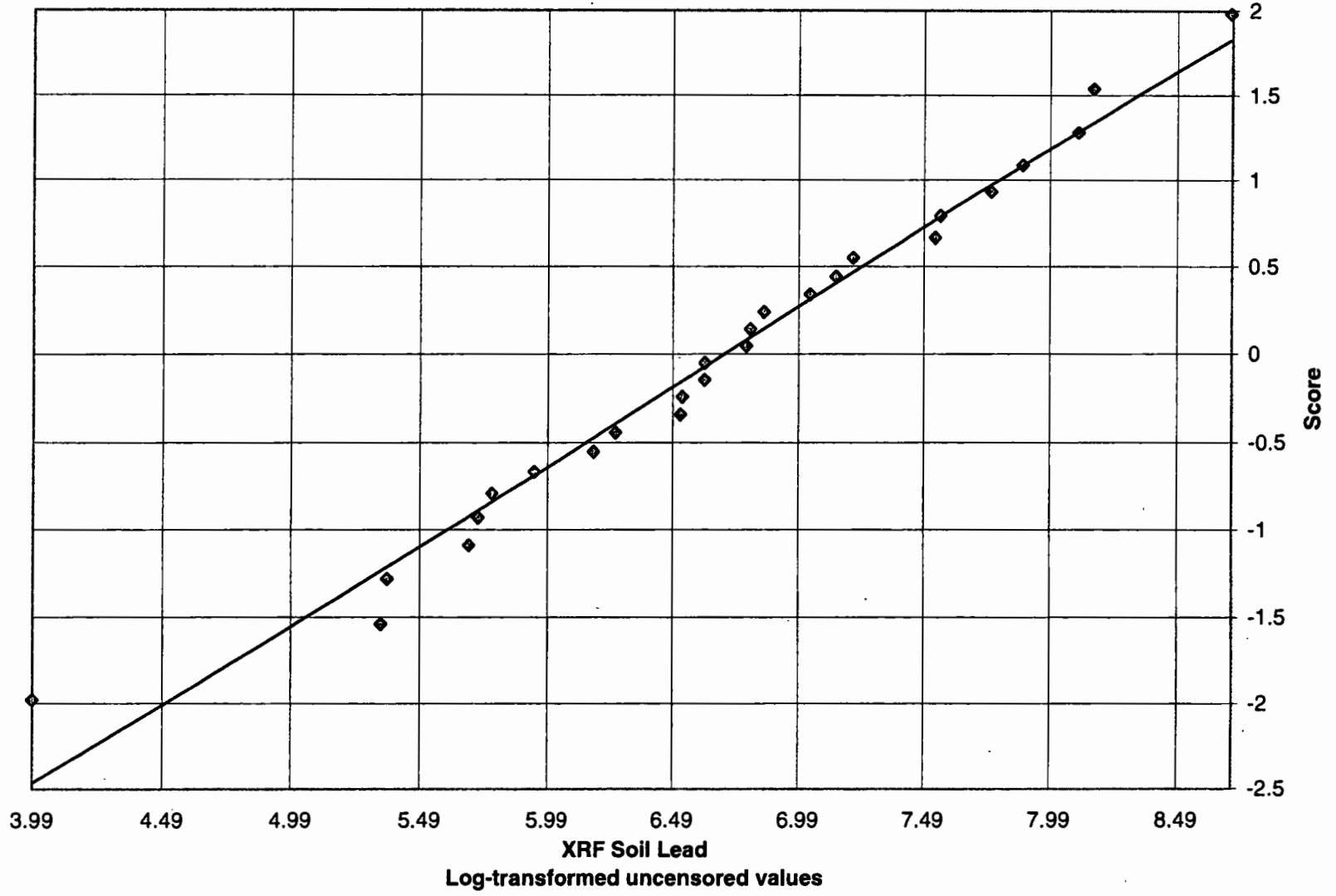
Lognormal distribution?		Normal distribution?	
r-squared is:	0.978	r-squared is:	0.765

Recommendations:
Assume lognormal distribution.
W value is 0.9832. This exceeds the tabled value of 0.92

UCL (Land's method) is 2389.87

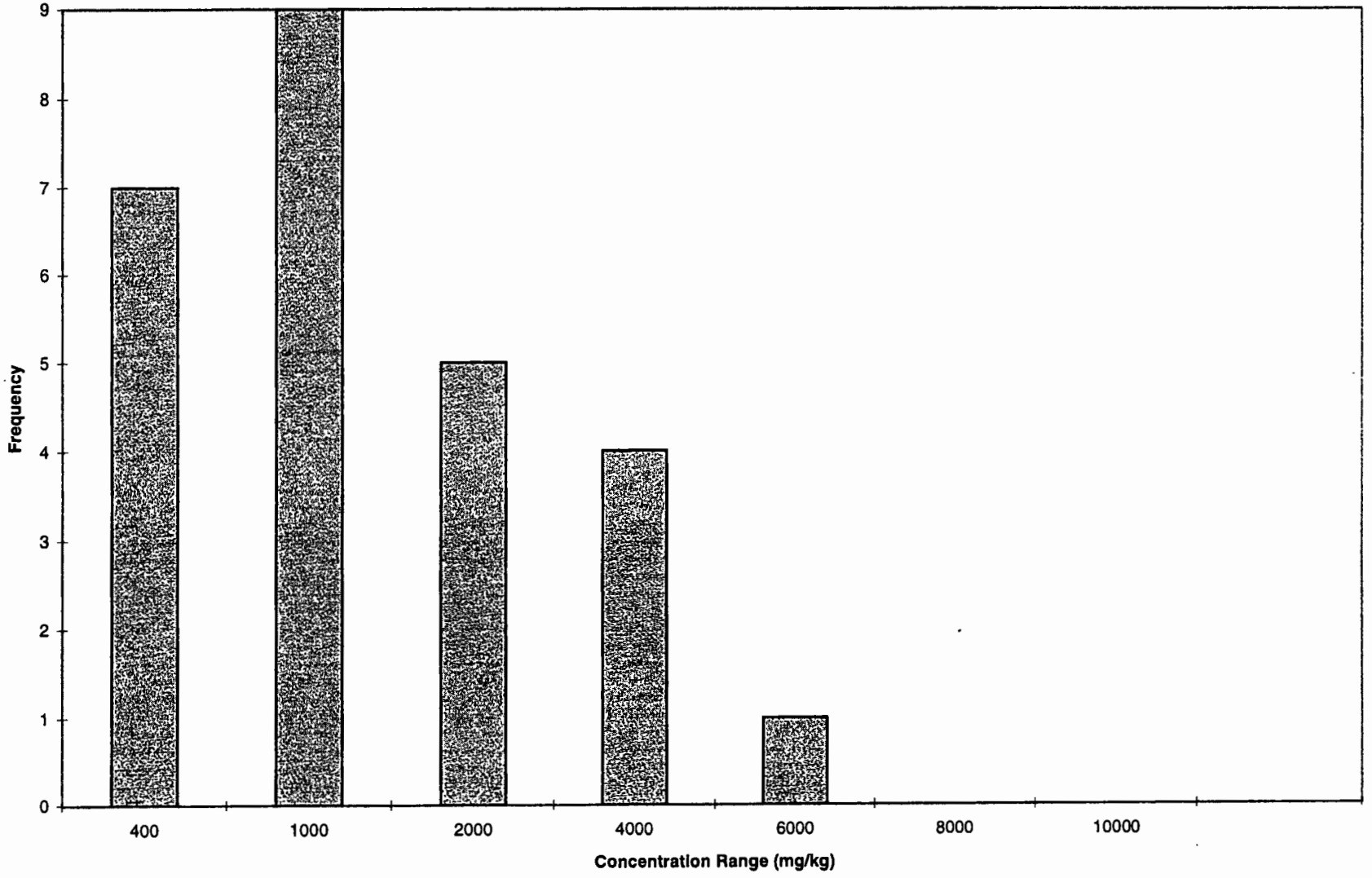
Mare Island Lead Based Paint Survey
Building H-71 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



H71XRFP.XLS

Mare Island Lead Based Paint Survey
Building H-71 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-71 Predicted Laboratory Soil Lead Summary Statistics

Conc (mg/kg)
160.11
285.69
289.77
355.01
363.98
377.85
425.14
507.51
543.39
668.98
673.06
724.43
725.25
834.53
845.94
885.9
1041.7
1142
1212.9
1641.1
1673.7
2021.1
2273.1
2799.1
2965.4
4985.4

Number of samples		26	Uncensored values		
Uncensored		26	Mean		1170.07
Censored		0	Lognormal mean		1177.49
Detection limit or PQL		50	Std. devn.		1094.85334
Method detection limit			Median		779.887
TOTAL		26	Min.		160.107
			Max.		4985.4205
Lognormal distribution?			Normal distribution?		
r-squared is:		0.988	r-squared is:		0.765

Recommendations:

Assume lognormal distribution.

W value is 0.9855. This exceeds the tabled value of 0.92

UCL (Land's method) is 1722.4

Laboratory concentration calculated from regression equation

Mare Island Lead Based Paint Survey
Building H-71 Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)

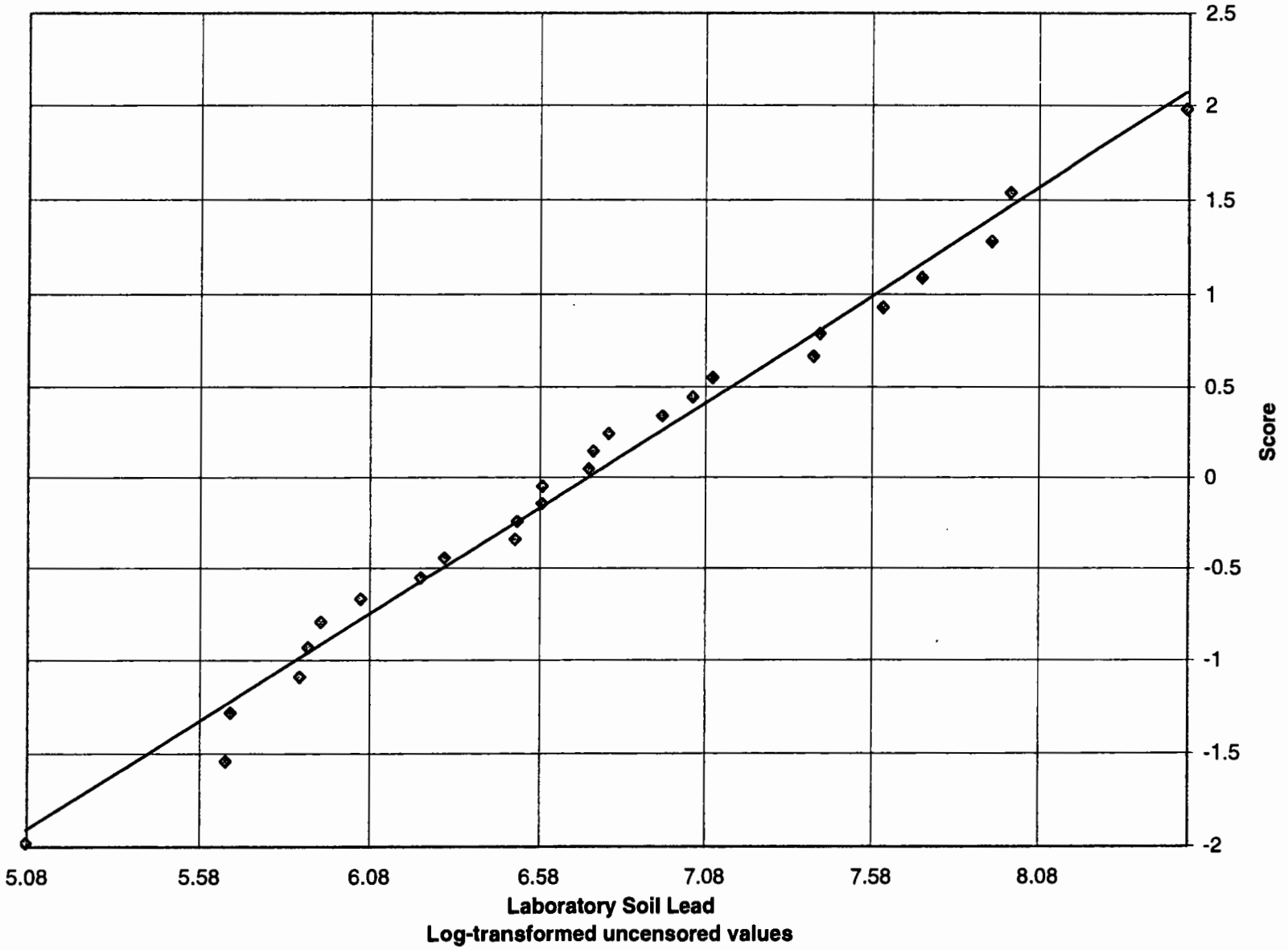
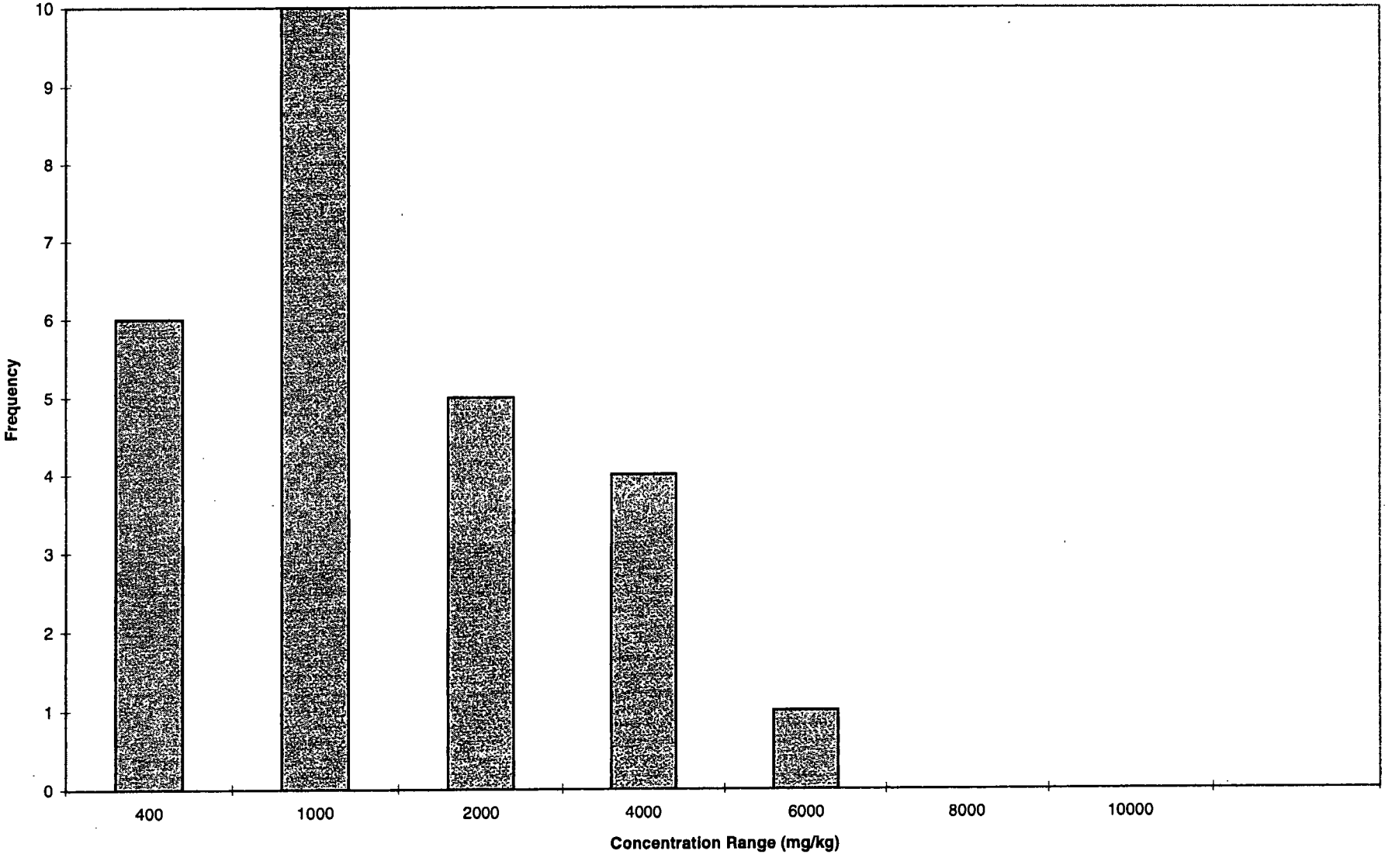


Chart7

Mare Island Lead Based Paint Survey
Building H-71 Predicted Laboratory Soil Lead Frequency Distribution



Mare IslandLead Based Paint Survey
Building H-72 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
223
309
334
346
436
456
543
643
716
728
745
750
1044
1049
1108
1297
1504
2066
2162
2326
2736
2894
2906
3354

Number of samples	24	Uncensored values	
Uncensored	24	Mean	1278.13
Censored	0	Lognormal mean	1318.29
Detection limit or PQL	50	Std. devn.	971.477553
Method detection limit		Median	897
TOTAL	24	Min.	223
		Max.	3354

Lognormal distribution?		Normal distribution?	
r-squared is:	0.967	r-squared is:	0.877

Recommendations:

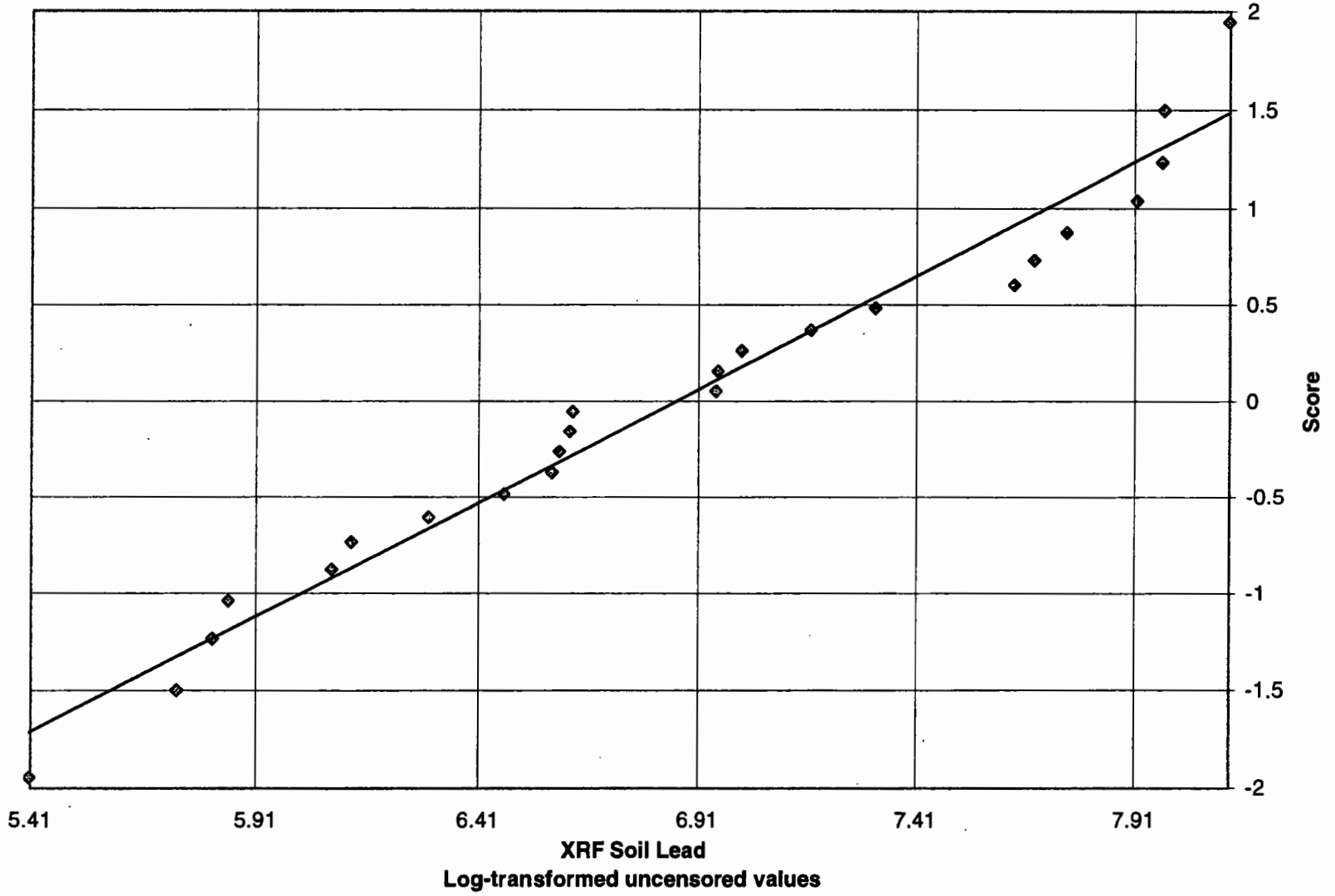
Assume lognormal distribution.

W value is 0.953. This exceeds the tabled value of 0.916

UCL (Land's method) is 1933.43

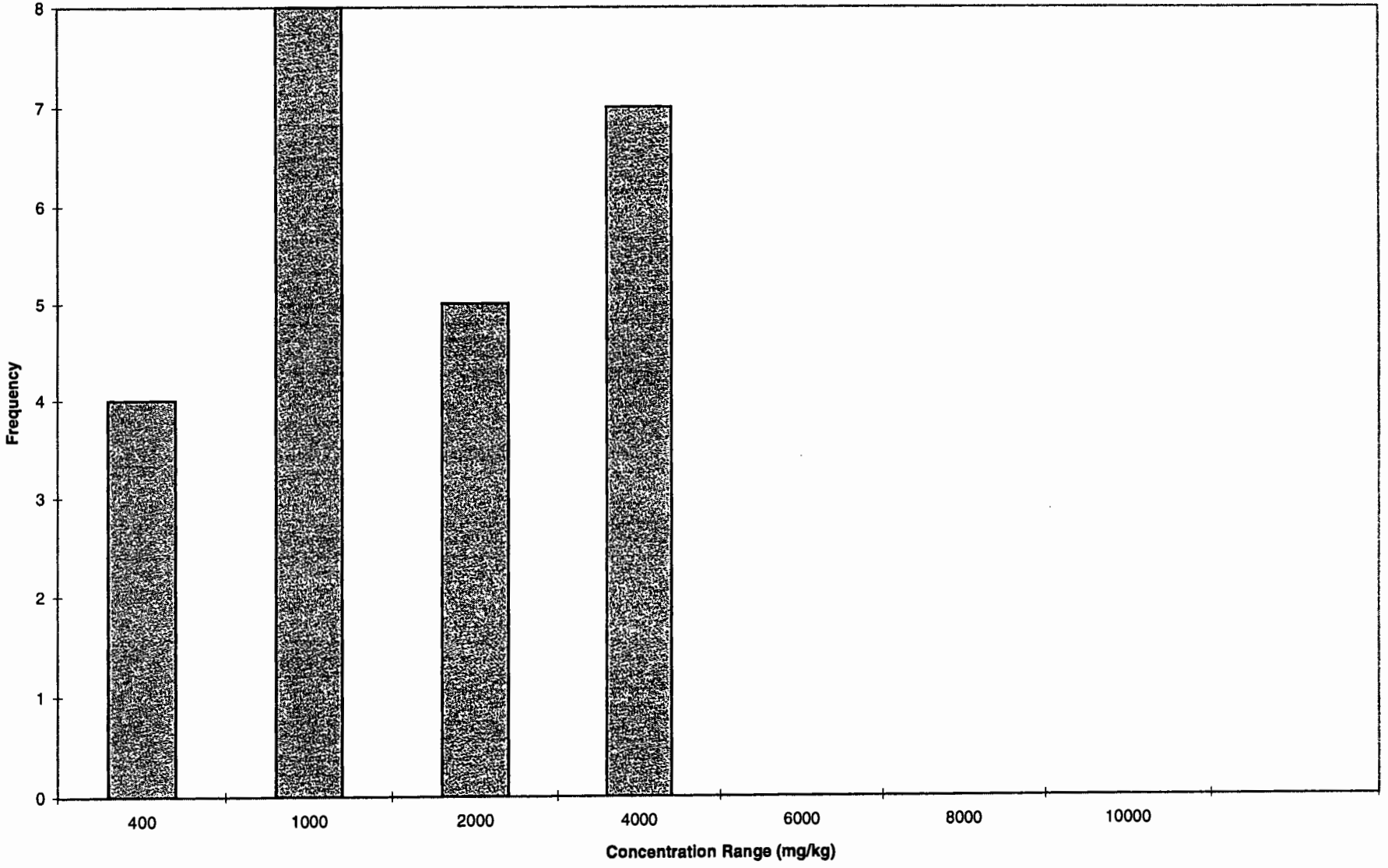
Mare Island Lead Based Paint Survey
Building H-72 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



H72XRFP.XLS

Mare Island Lead Base Paint Survey
Building H-72 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-72 Predicted Laboratory Soil Lead Summary Statistics

Calc Conc (mg/kg)
297.93
368.06
388.45
398.23
471.63
487.94
558.89
640.44
699.97
709.75
723.62
727.7
967.45
971.53
1019.6
1173.8
1342.6
1800.9
1879.2
2012.9
2347.3
2476.1
2485.9

Number of samples	24	Uncensored values	
Uncensored	24	Mean	1158.38
Censored	0	Lognormal mean	1174.04
Detection limit or PQL	50	Std. devn.	792.239944
Method detection limit		Median	847.5735
TOTAL	24	Min.	297.9265
		Max.	2851.257

Lognormal distribution?		Normal distribution?	
r-squared is:	0.961	r-squared is:	0.877

Recommendations:

Assume lognormal distribution.

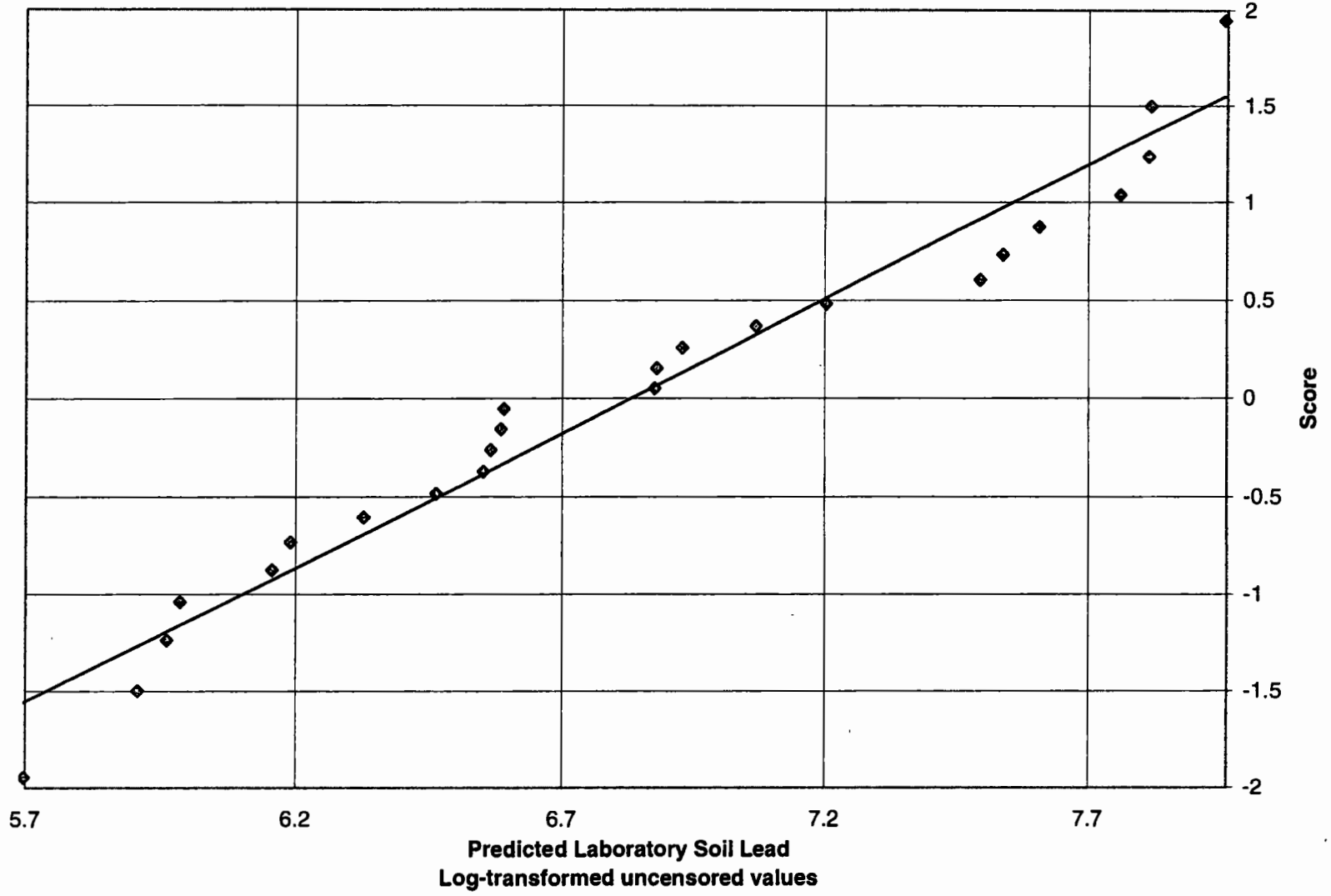
W value is 0.9449. This exceeds the tabled value of 0.916

UCL (Land's method) is 1599.08

Laboratory Concentration calculated from regression equation

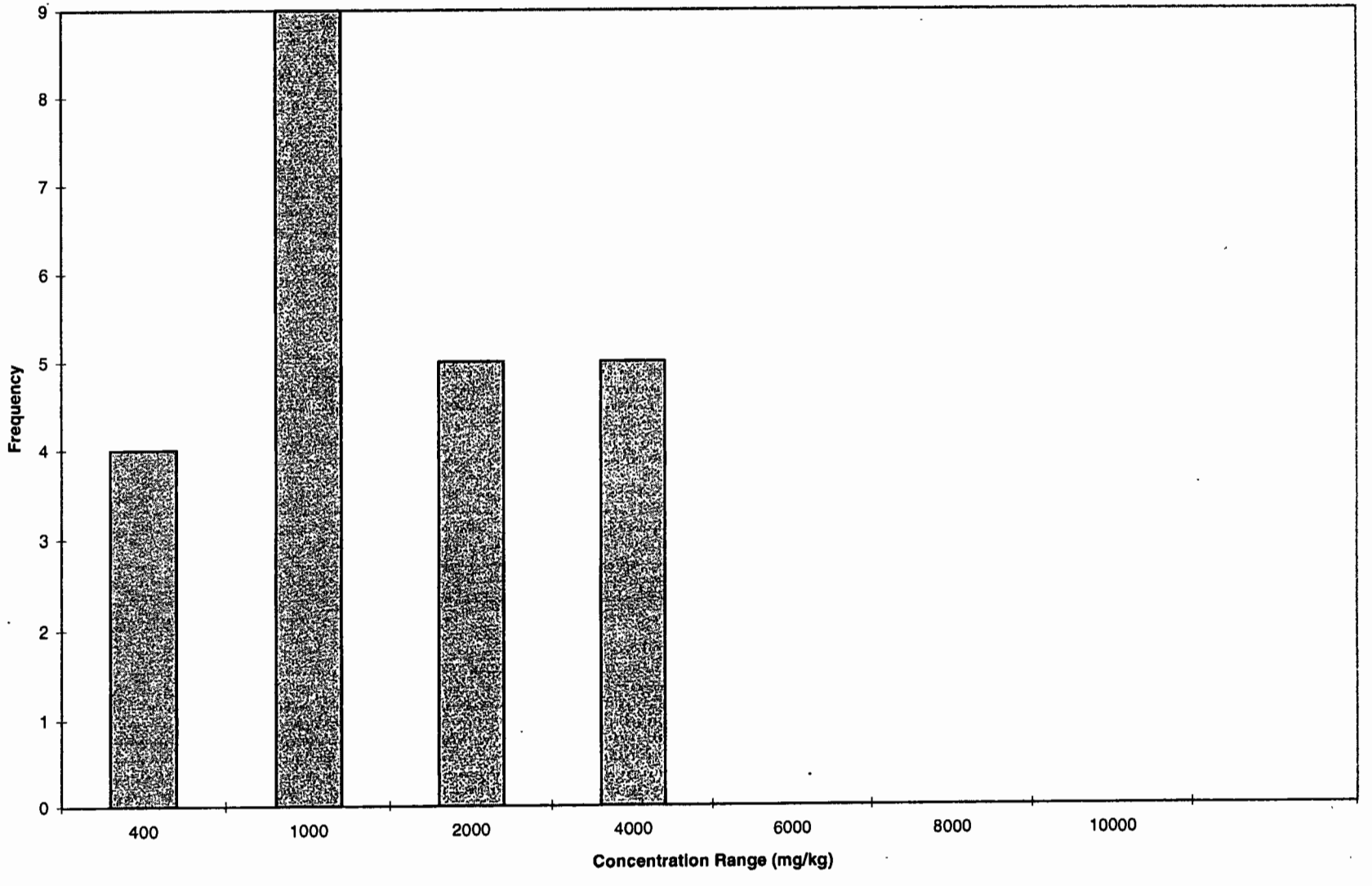
Mare Island Lead Based Paint Survey
Building H-72 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



H72LABP.XLS

Mare Island Lead Based Paint Survey
Building H-72 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-80 XRF Soil Lead Summary Statistics

Conc (mg/kg)
237
476
482
690

Number of samples	4	Uncensored values	
Uncensored	4	Mean	471.25
Censored	0	Lognormal mean	486.38
Detection limit or PQL	50	Std. devn.	185.169067
Method detection limit		Median	479
TOTAL	4	Min.	237
		Max.	690

Lognormal distribution?	Normal distribution?	
r-squared is:	r-squared is:	0.929

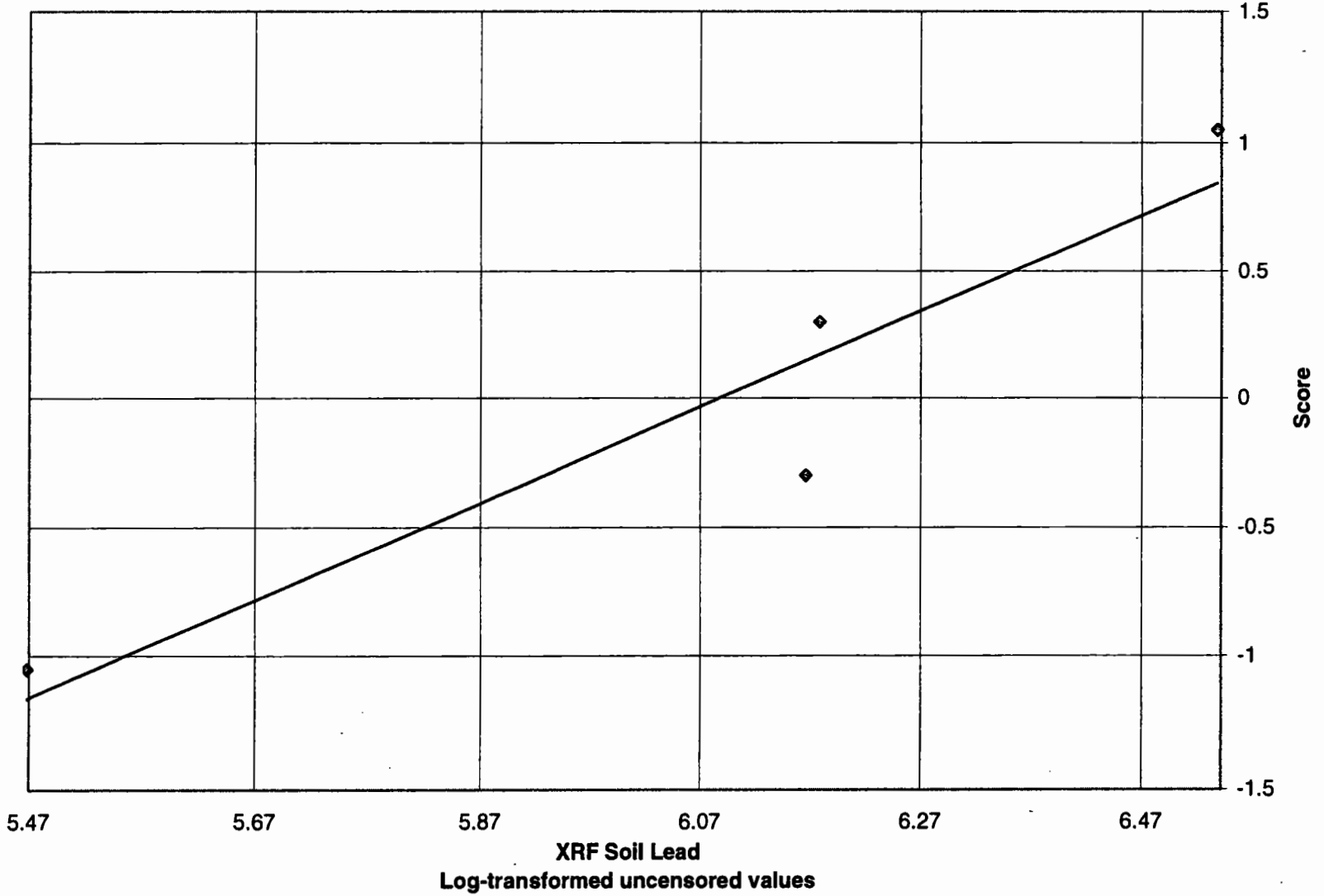
Recommendations:
Assume lognormal distribution.
W value is 0.9044. This exceeds the tabled value of 0.748

UCL (Land's method) is 1170.66

Statistics may not be reliable due to small number of samples

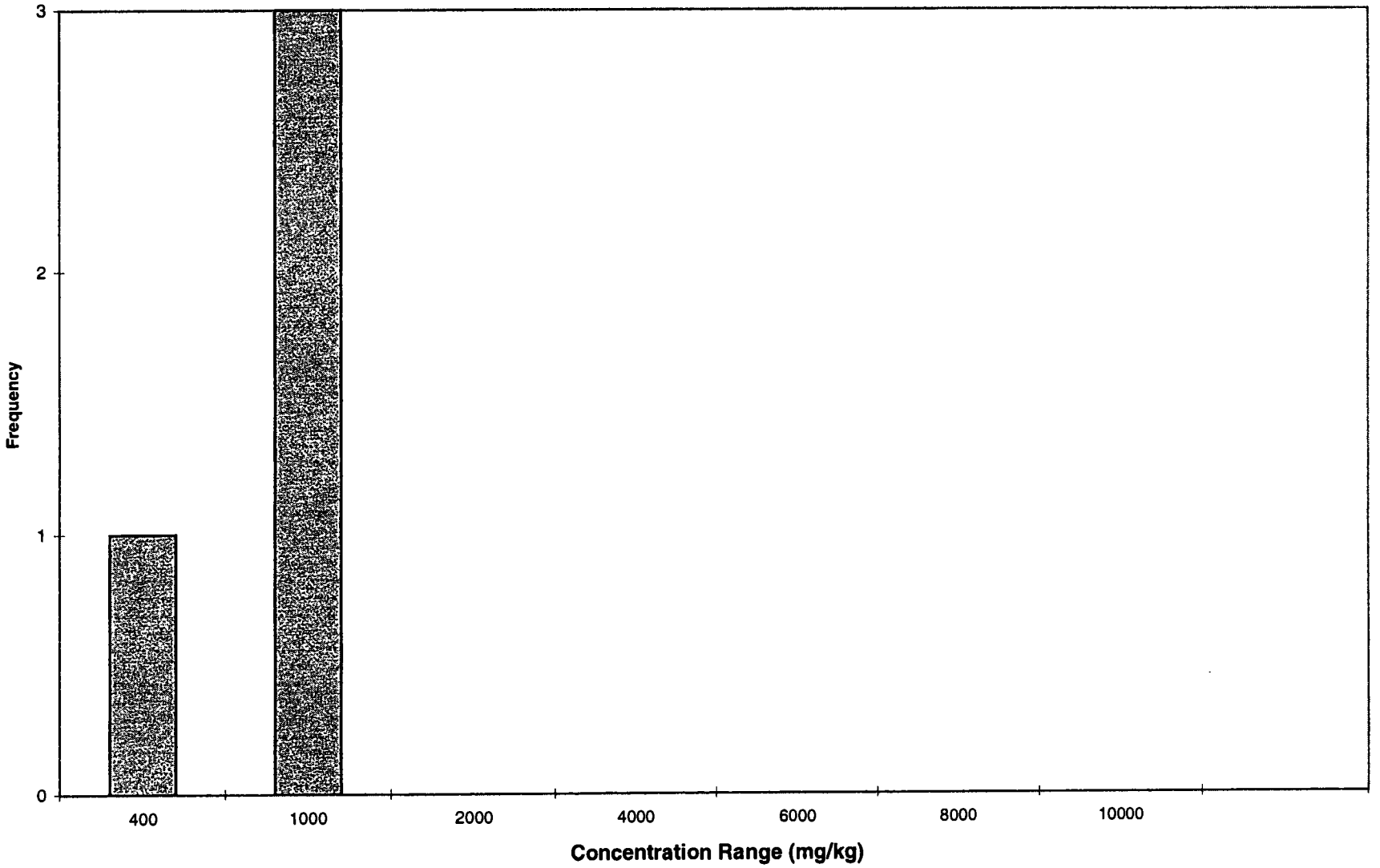
Mare Island Lead Based Paint Survey
Building H-80 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



H80XRFP.XLS

Mare Island Lead Based Paint Survey
Building H-80 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-80 Predicted Laboratory Soil Lead Summary Statistics

Pred Conc (mg/kg)
309.34
504.25
509.14
678.77

Number of samples	4	Uncensored values	
Uncensored	4	Mean	500.37
Censored	0	Lognormal mean	508.15
Detection limit or PQL	50	Std. devn.	151.005374
Method detection limit		Median	506.6945
TOTAL	4	Min.	309.3435
		Max.	678.765

Lognormal distribution?	Normal distribution?	
r-squared is:	r-squared is:	0.929

Recommendations:
Assume lognormal distribution.
W value is 0.92. This exceeds the tabled value of 0.748

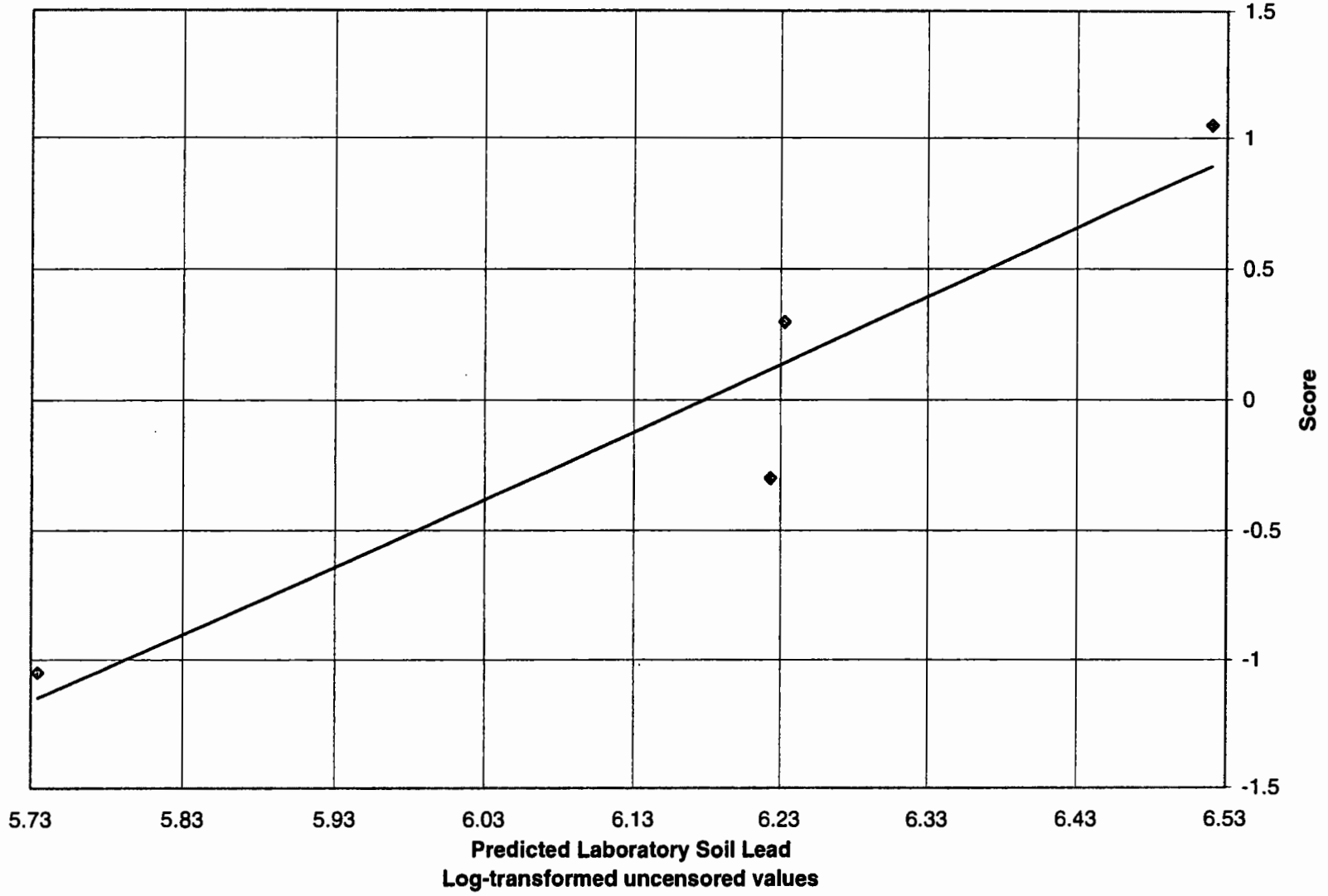
UCL (Land's method) is 873.96

Predicted laboratory concentrations calculated from regression equation

Statistics may not be reliable due to small number of samples

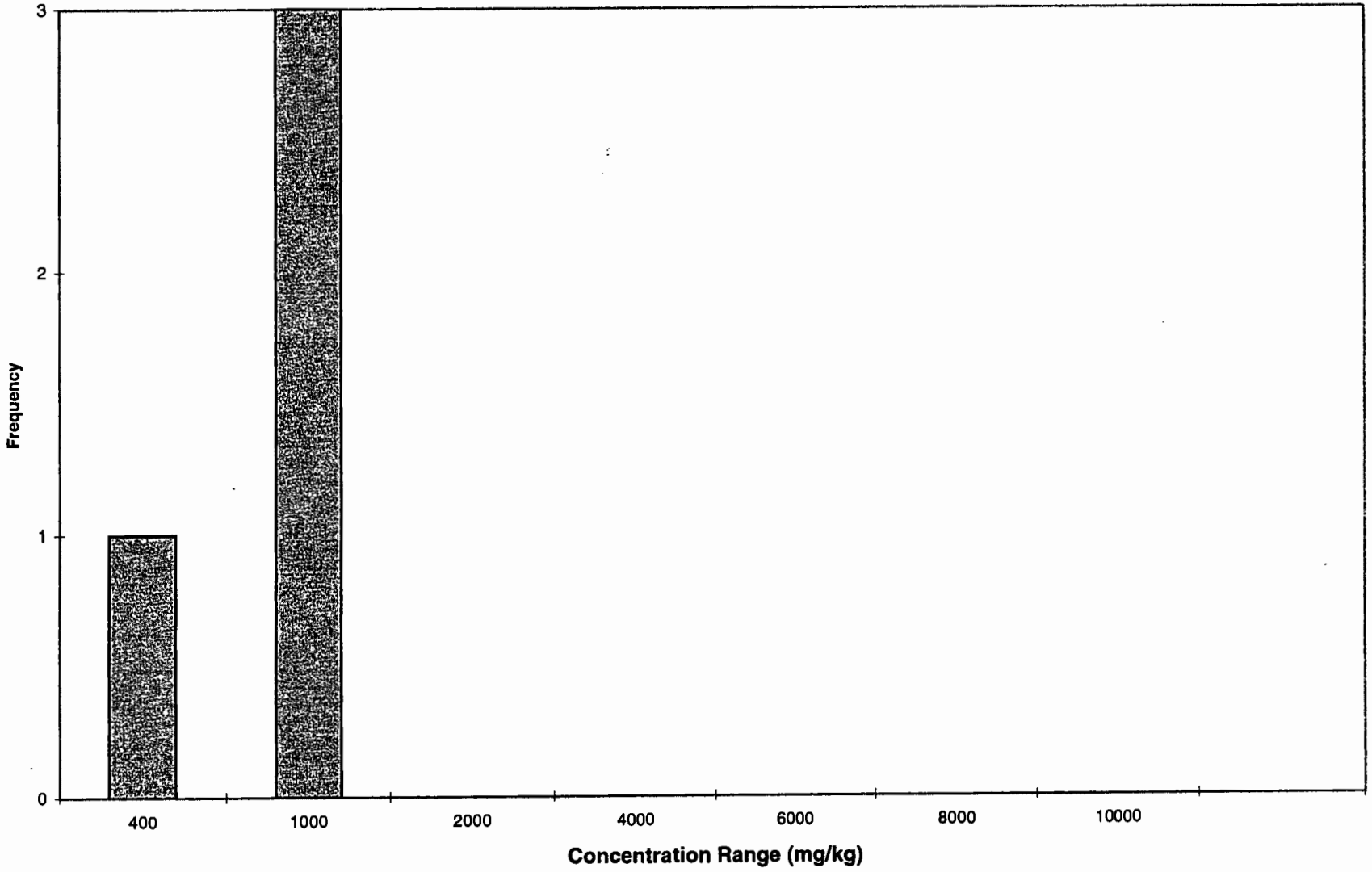
Mare Island Lead Based Paint Survey
Building H-80 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



H80LABP.XLS

Mare Island Lead Based Paint Survey
Building H-80 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-83 XRF Soil Lead Summary Statistics

Conc (mg/kg)
451
553
752
759
855
866
894
1025
1267
1336
1350
1412
1452
1562
2022
2075
2477
2690
3107
3437
4259
6045

Number of samples	22	Uncensored values	
Uncensored	22	Mean	1847.55
Censored	0	Lognormal mean	1853.67
Detection limit or PQL	50	Std. devn.	1372.41781
Method detection limit		Median	1381
TOTAL	22	Min.	451
		Max.	6045

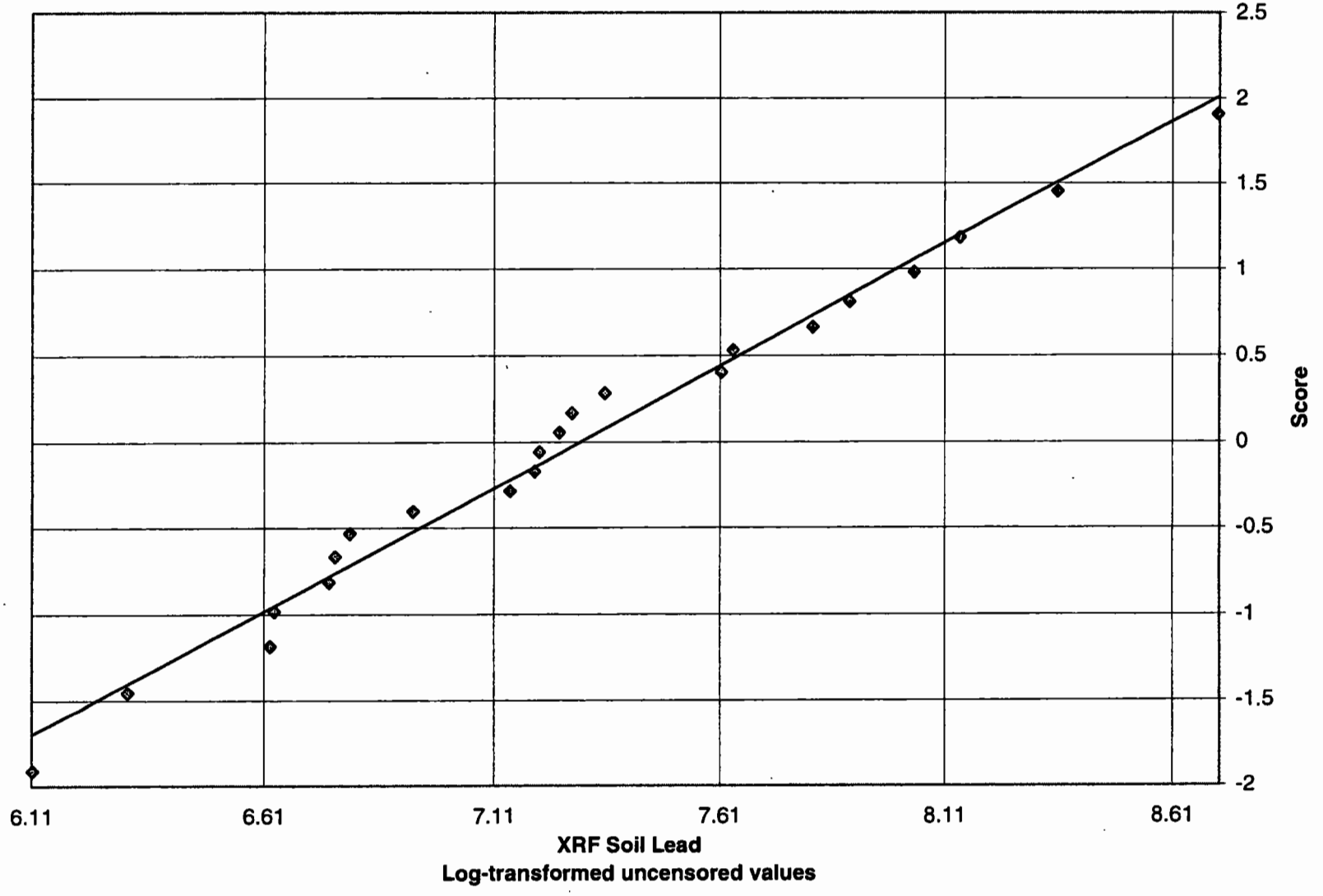
Lognormal distribution?		Normal distribution?	
r-squared is:	0.985	r-squared is:	0.824

Recommendations:
Assume lognormal distribution.
W value is 0.9812. This exceeds the tabled value of 0.911

UCL (Land's method) is 2541.76

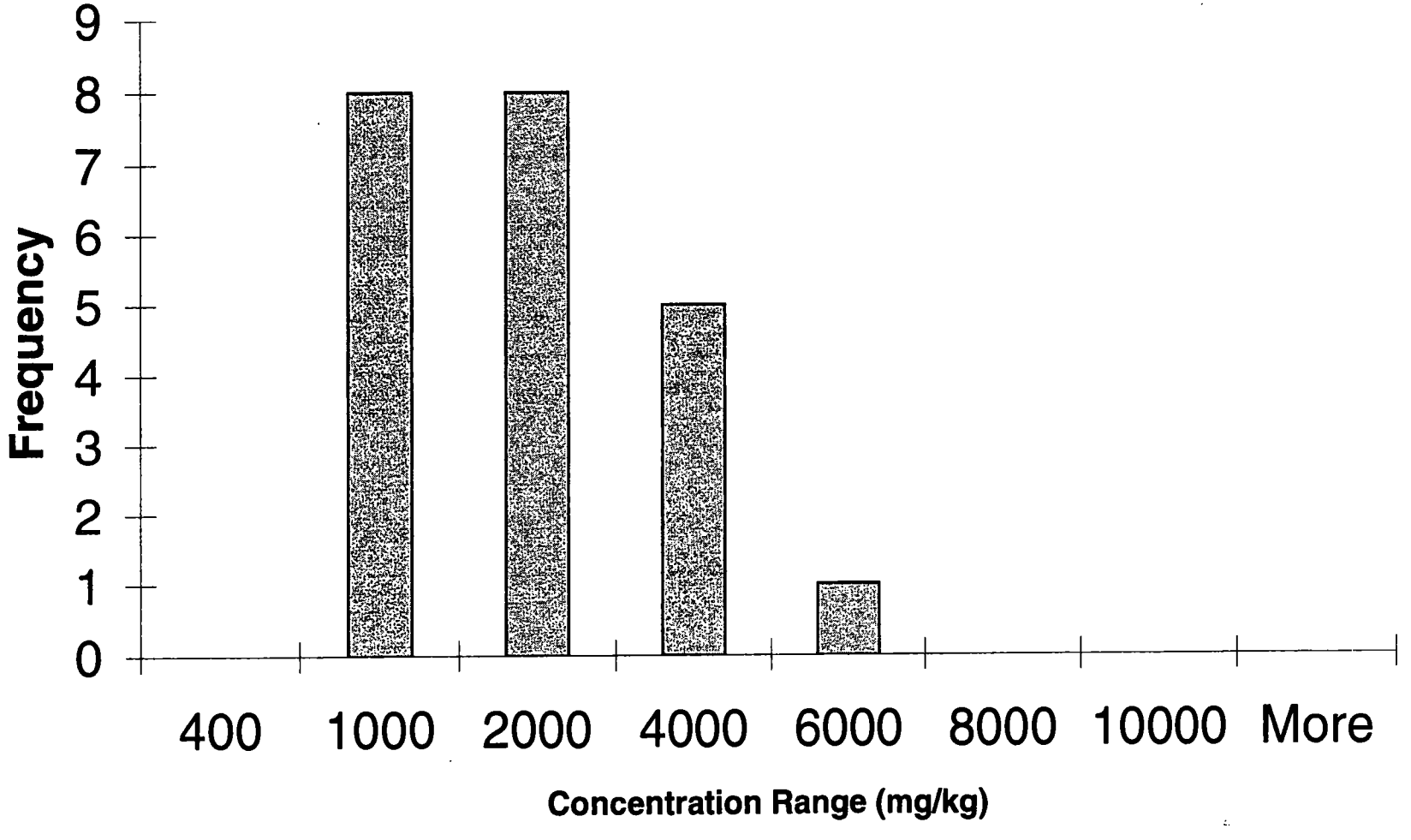
Mare Island Lead Based Paint Survey
Building H-83 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



H83XRFP.XLS

Mare Island Lead Based Paint Survey
Building H-83 Predicted Laboratory Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-83 Predicted Laboratory Soil Lead Summary Statistics

Pred Conc (mg/kg)
483.86
567.04
729.33
735.03
813.32
822.29
845.13
951.96
1149.3
1205.6
1217
1267.6
1300.2
1389.9
1765
1808.2
2136.1
2309.8
2649.8
2918.9
3589.3
5045.8

Number of samples	22	Uncensored values	
Uncensored	22	Mean	1622.74
Censored	0	Lognormal mean	1621.03
Detection limit or PQL	50	Std. devn.	1119.20672
Method detection limit		Median	1242.2755
TOTAL	22	Min.	483.8605
		Max.	5045.7675

Lognormal distribution?		Normal distribution?	
r-squared is:	0.979	r-squared is:	0.824

Recommendations:

Assume lognormal distribution.

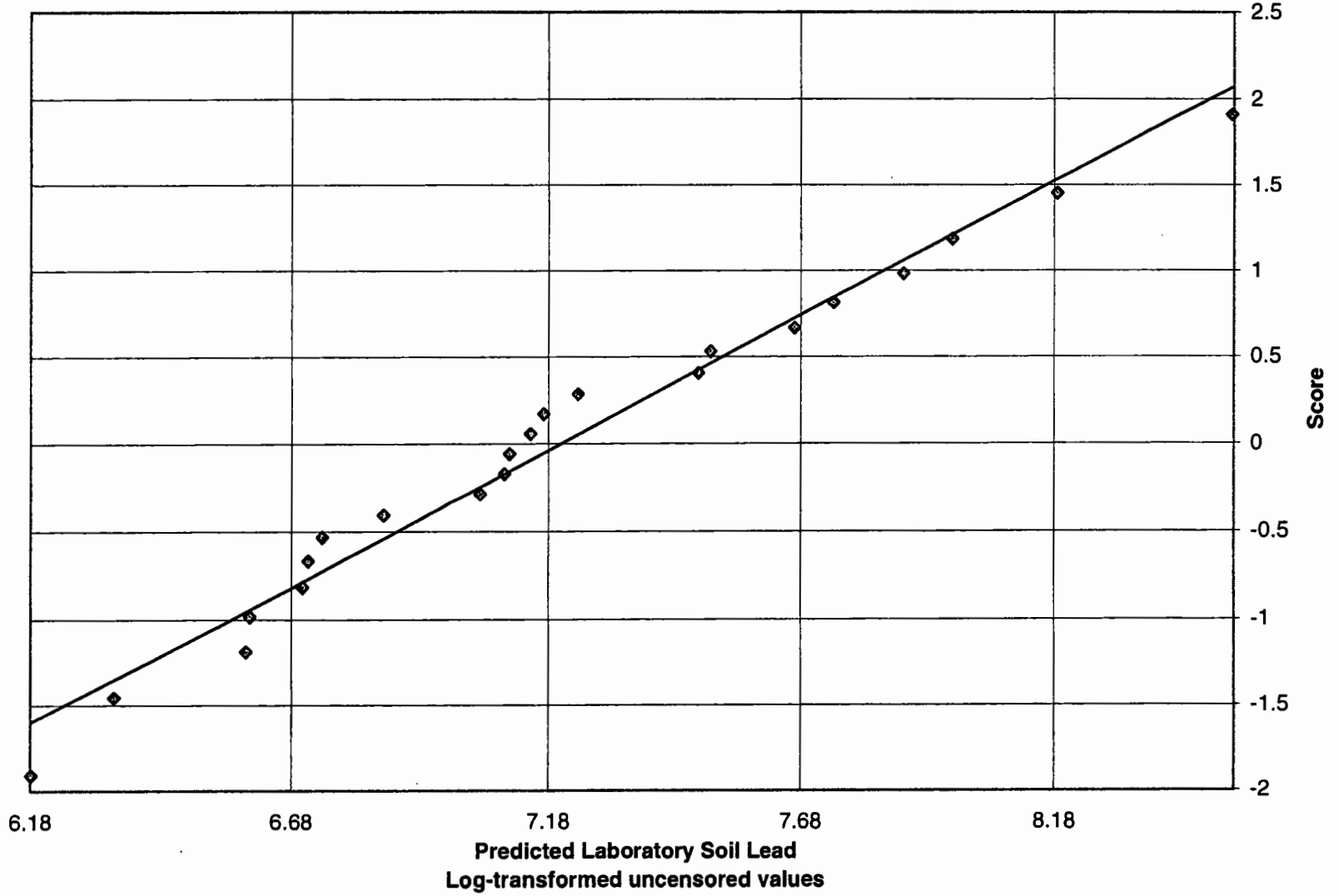
W value is 0.9748. This exceeds the tabled value of 0.911

UCL (Land's method) is 2141.62

Predicted laboratory concentration calculated from regression equation

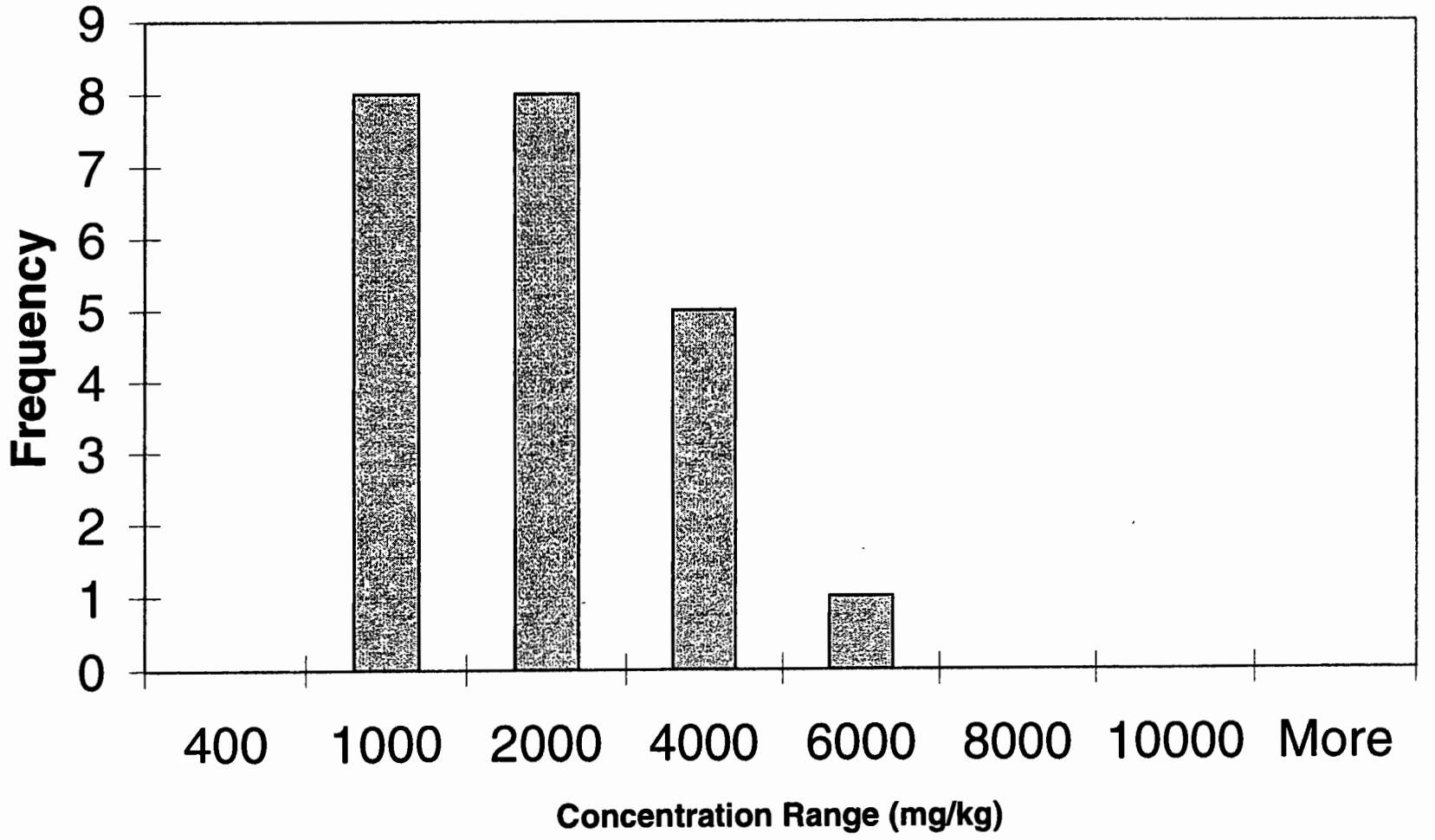
Mare Island Lead Based Paint Survey
Building H-83 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



H83LABP.XLS

Mare Island Lead Based Paint Survey
Building H-83 Predicted Laboratory Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-84 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
1730
1483
3923
2074
1907
10300
1251
2886
1638
409
1909
506
1135
514
816
1178
299

Number of samples	17	Uncensored values	
Uncensored	17	Mean	1997.53
Censored	0	Lognormal mean	1978.70
Detection limit or PQL	50	Std. devn.	2333.42747
Method detection limit		Median	1483
TOTAL	17	Min.	299
		Max.	10300

Lognormal distribution?		Normal distribution?	
r-squared is:	0.958	r-squared is:	0.591

Recommendations:

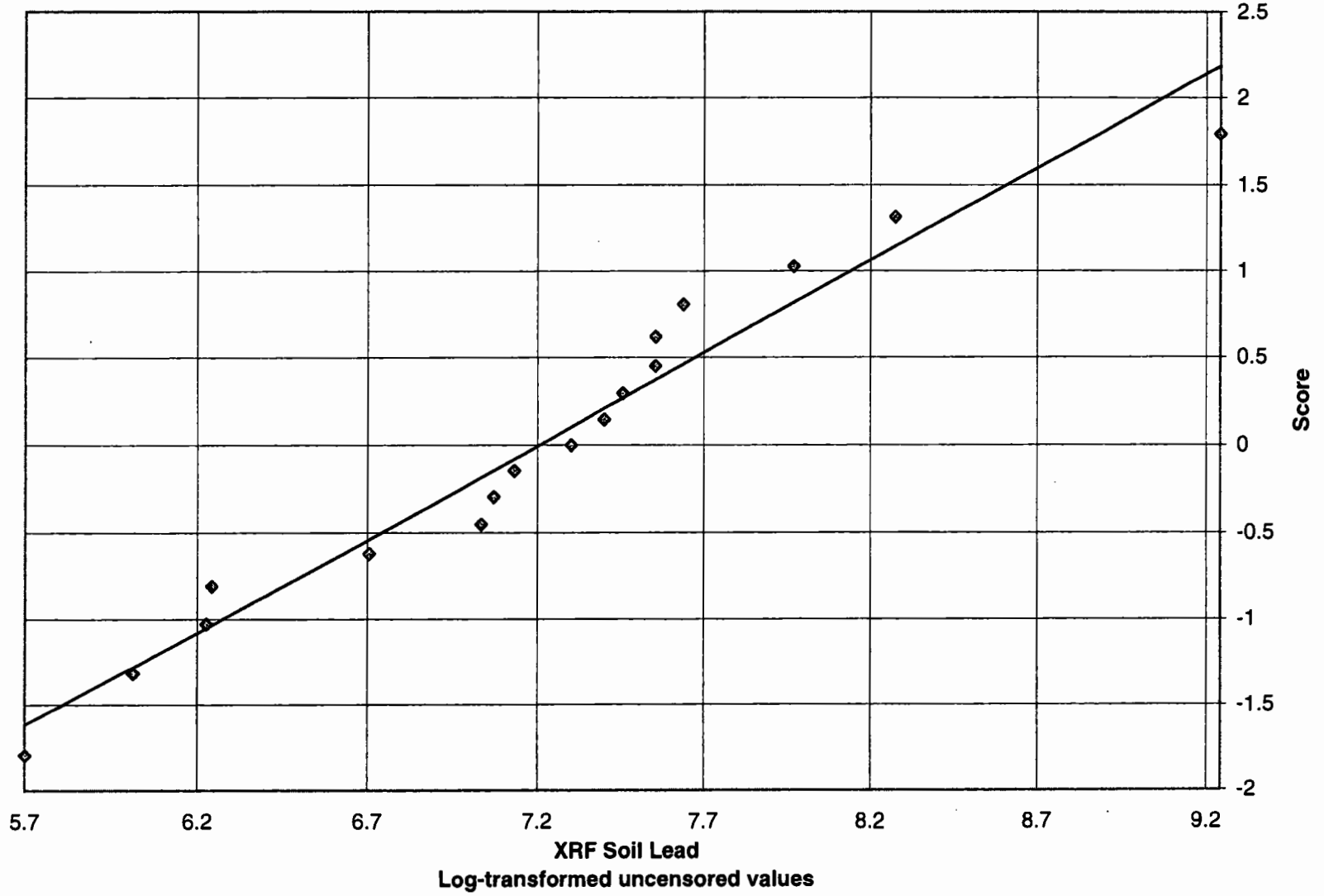
Assume lognormal distribution.

W value is 0.9653. This exceeds the tabled value of 0.892

UCL (Land's method) is 3413.57

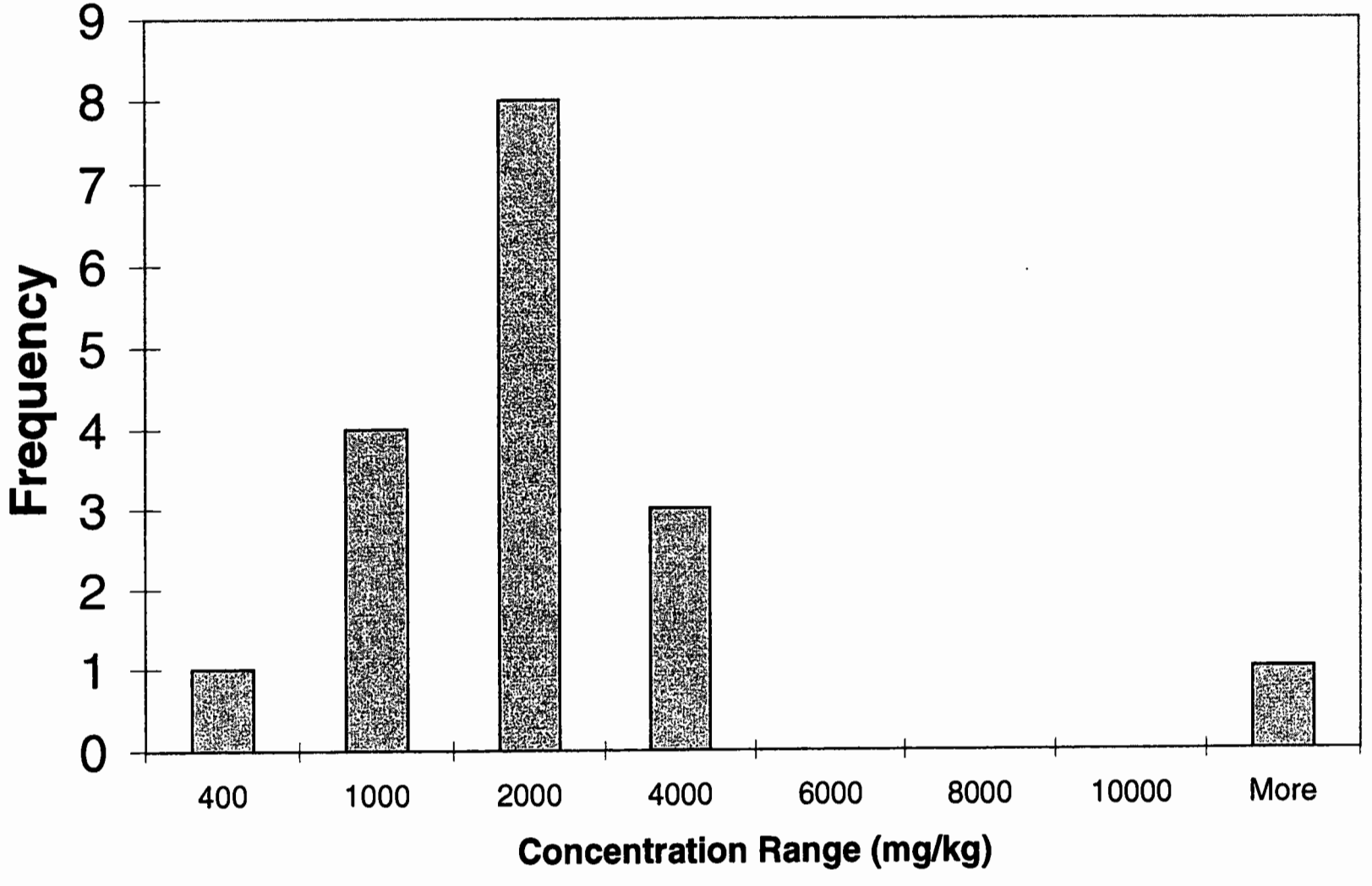
Mare Island Lead Based Paint Survey
Building H-84 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



84XRFP.XLS

Mare Island Lead Based Paint Survey
Building H-84 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building H-84 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
1526.9
1325.5
3315.3
1807.4
1671.2
8515.7
1136.3
2469.6
1451.9
449.61
1672.9
528.71
1041.7
535.24
781.52
1076.7
359.9

Number of samples	17	Uncensored values	
Uncensored	17	Mean	1745.06
Censored	0	Lognormal mean	1704.47
Detection limit or PQL	50	Std. devn.	1902.9101
Method detection limit		Median	1325.4565
TOTAL	17	Min.	359.9045
		Max.	8515.72

Lognormal distribution?		Normal distribution?	
r-squared is:	0.948	r-squared is:	0.591

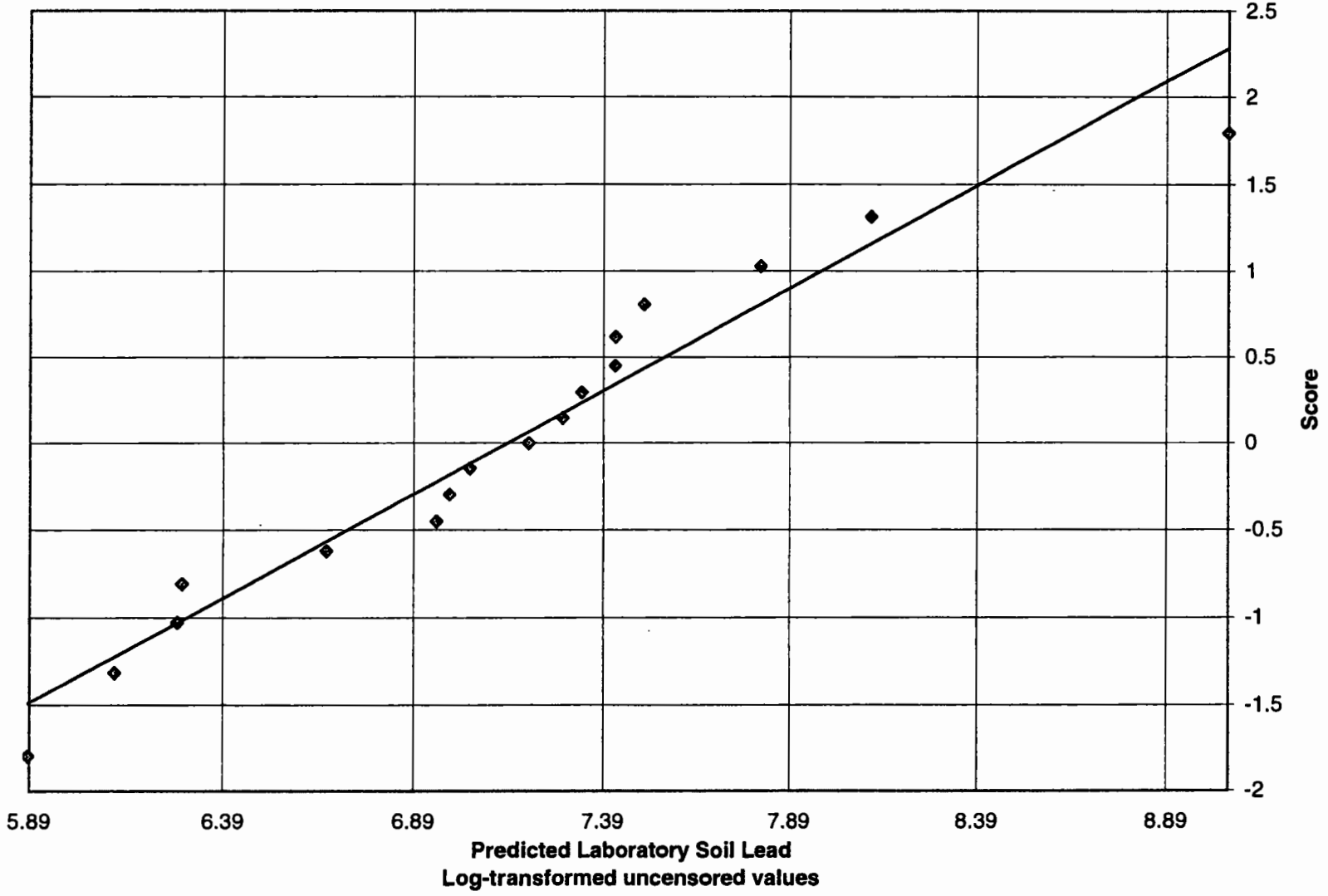
Recommendations:
Assume lognormal distribution.
W value is 0.9557. This exceeds the tabled value of 0.892

UCL (Land's method) is 2707.48

Predicted Laboratory concentration calculated from regression equation

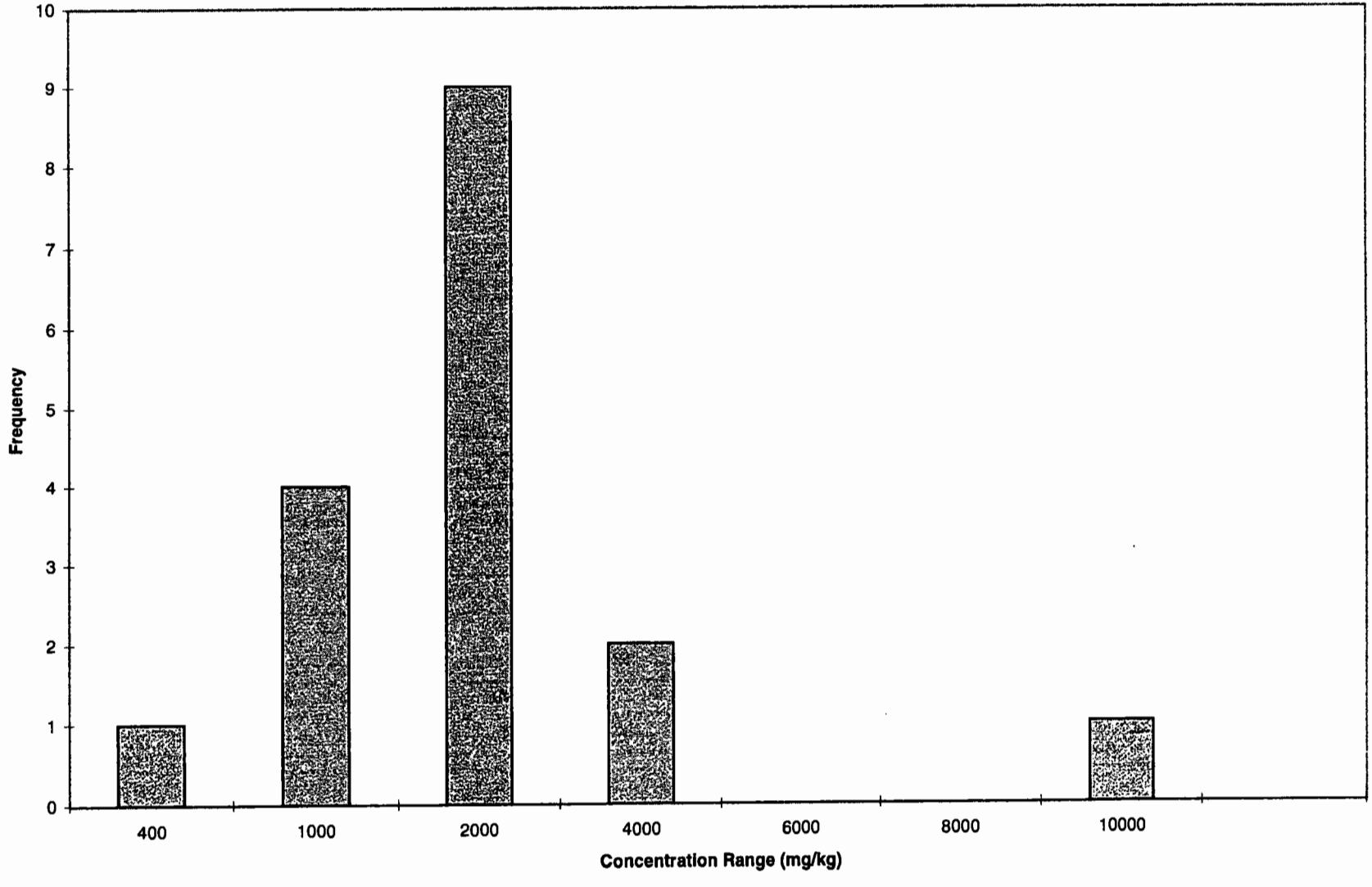
Mare Island Lead Based Paint Survey
Building H-84 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



84LABP.XLS

Mare Island Lead Based Paint Survey
Building H-84 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Tank 188 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
4669
4835
8019
10400
2658
831
3003
3094

Number of samples	8	Uncensored values	
Uncensored	8	Mean	4688.63
Censored	0	Lognormal mean	5056.60
Detection limit or PQL	50	Std. devn.	3119.56686
Method detection limit		Median	3881.5
TOTAL	8	Min.	831
		Max.	10400

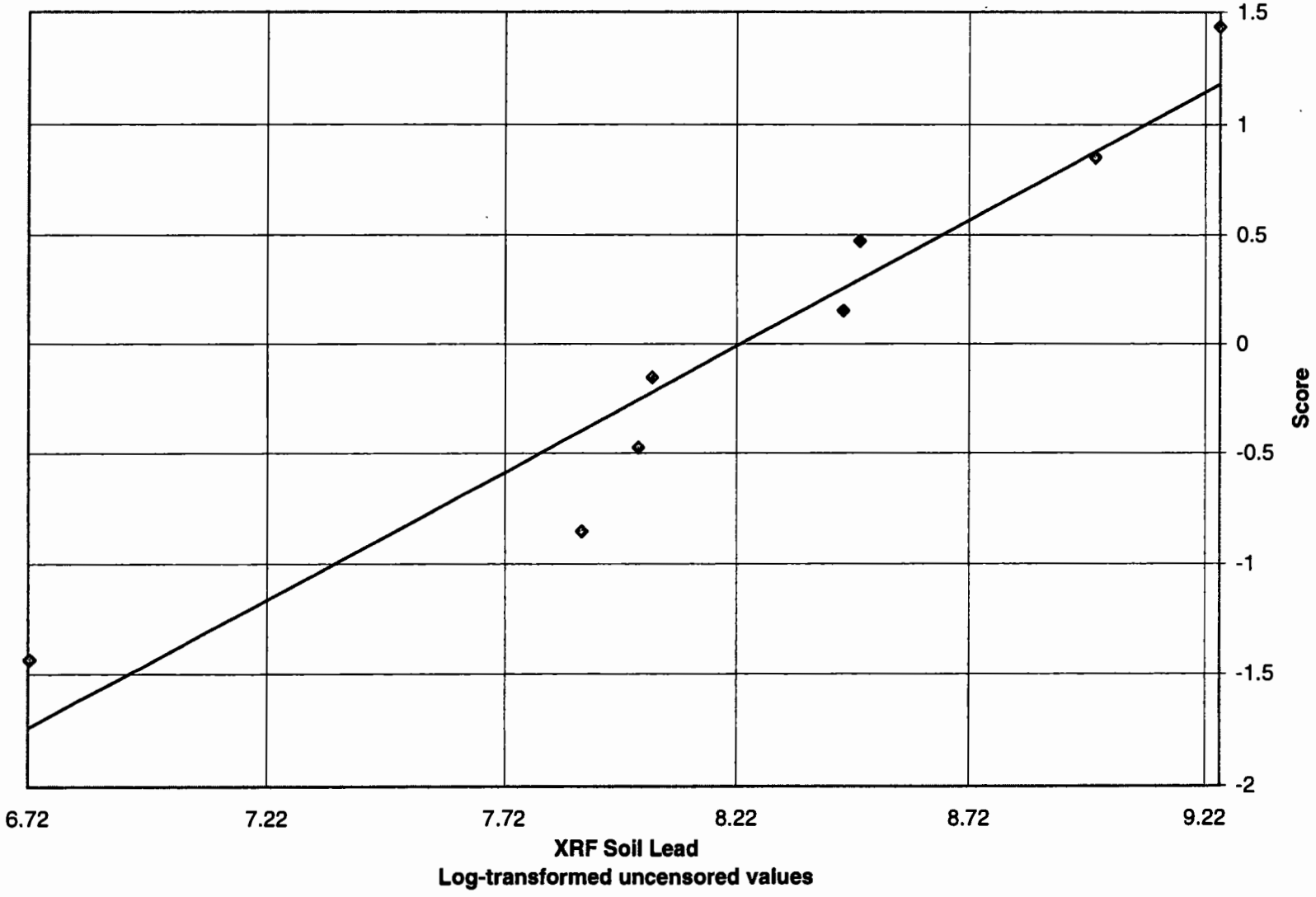
Lognormal distribution?		Normal distribution?	
r-squared is:	0.924	r-squared is:	0.912

Recommendations:
Assume lognormal distribution.
W value is 0.9365. This exceeds the tabled value of 0.818

UCL (Land's method) is 11820.24

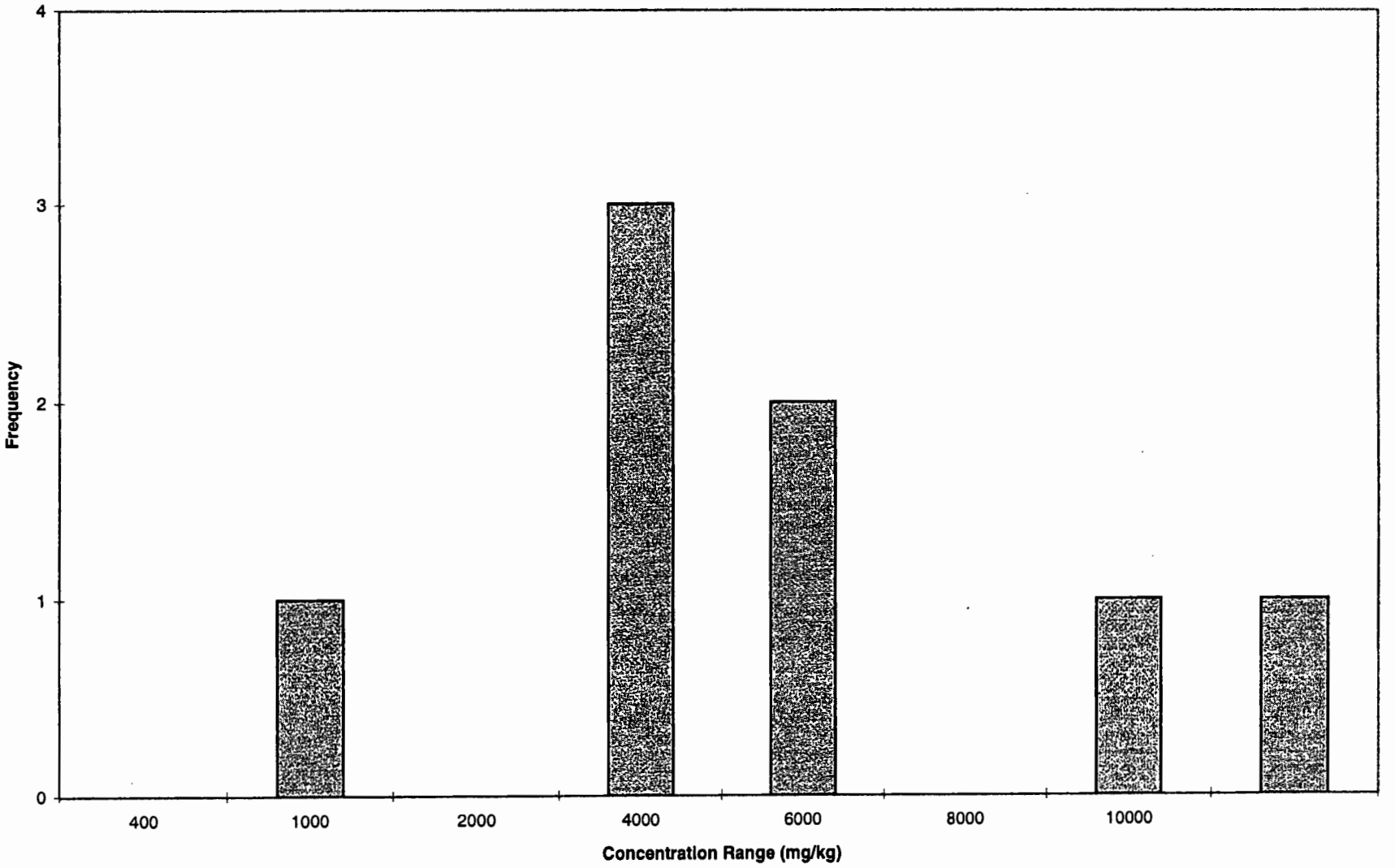
Mare Island Lead Based Paint Survey
Tank 188 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



188XRFP.XLS

Mare Island Lead Based Paint Survey
Tank 188 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Tank 188 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
3923.6
4059
6655.6
8597.3
2283.7
793.75
2565
2639.2

Number of samples	8	Uncensored values	
Uncensored	8	Mean	3939.64
Censored	0	Lognormal mean	4193.12
Detection limit or PQL	50	Std. devn.	2544.00678
Method detection limit		Median	3281.43325
TOTAL	8	Min.	793.7505
		Max.	8597.27

Lognormal distribution?		Normal distribution?	
r-squared is:	0.932	r-squared is:	0.912

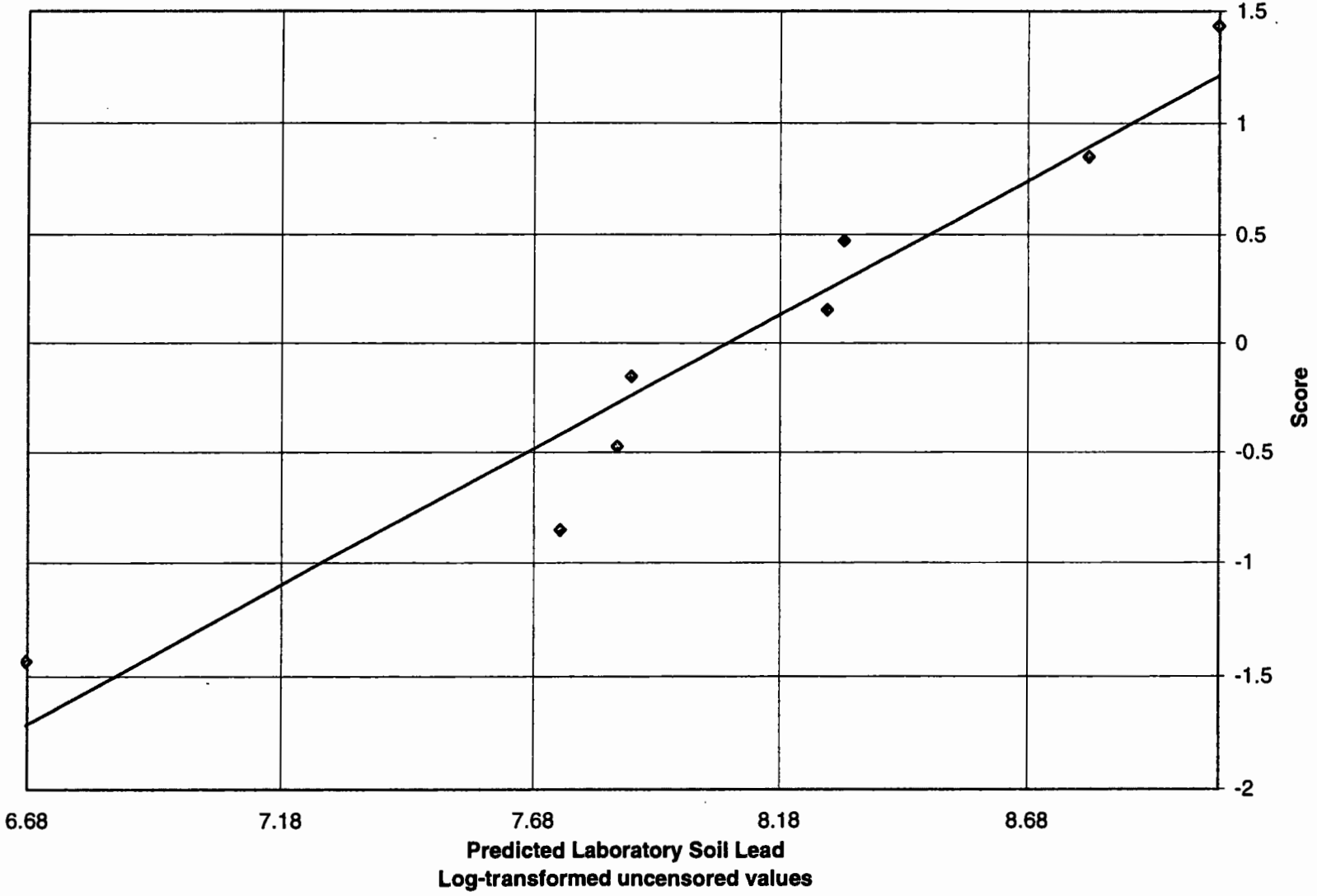
Recommendations:
Assume lognormal distribution.
W value is 0.9439. This exceeds the tabled value of 0.818

UCL (Land's method) is 9115.35

Predicted laboratory concentrations calculated from regression equation

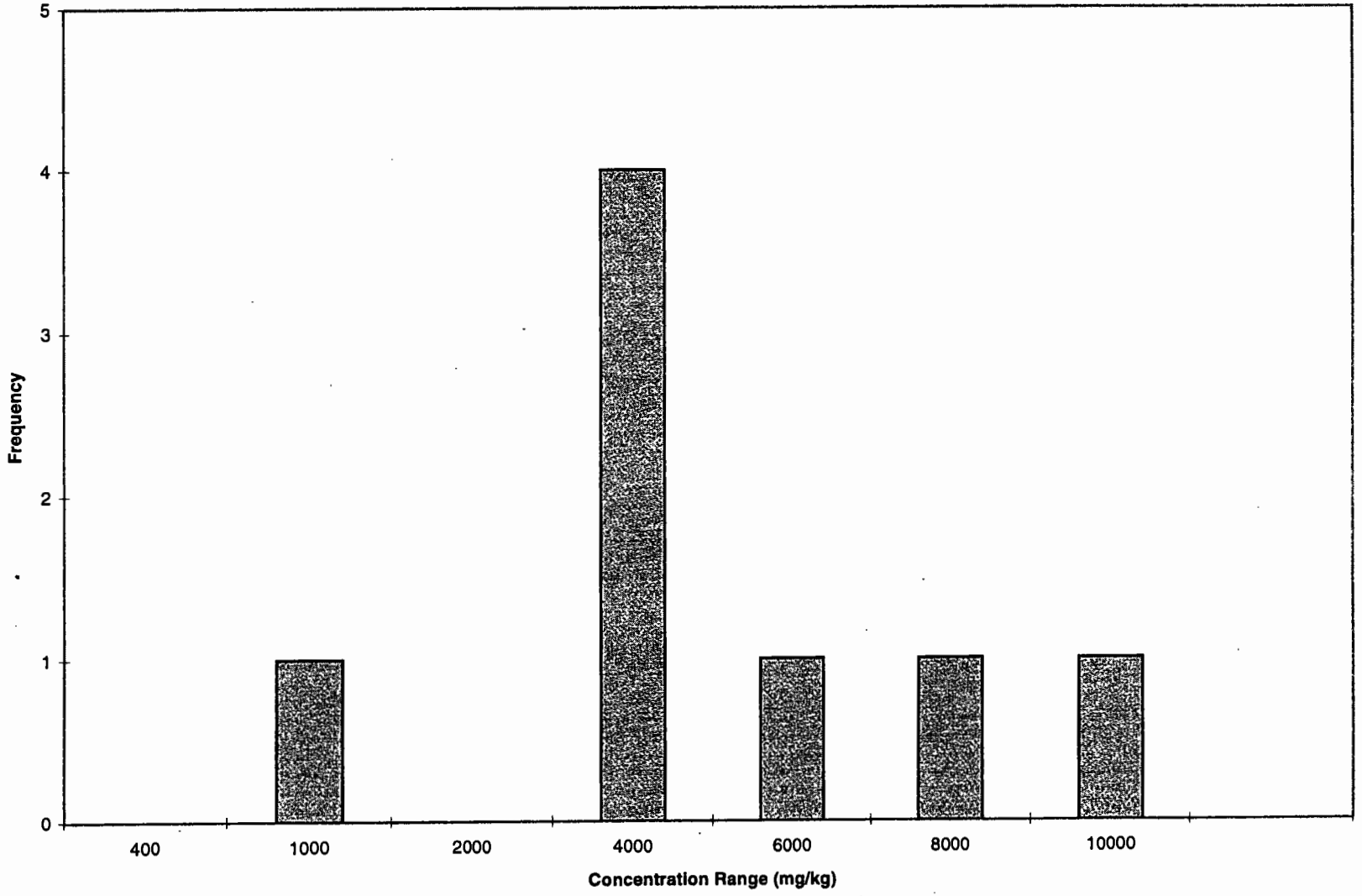
Mare Island Lead Based Paint Survey
Tank 188 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



188LABP.XLS

Mare Island Lead Based Paint Survey
Tank 188 Predicted Laboratory Soil Lead Frequency Distribution

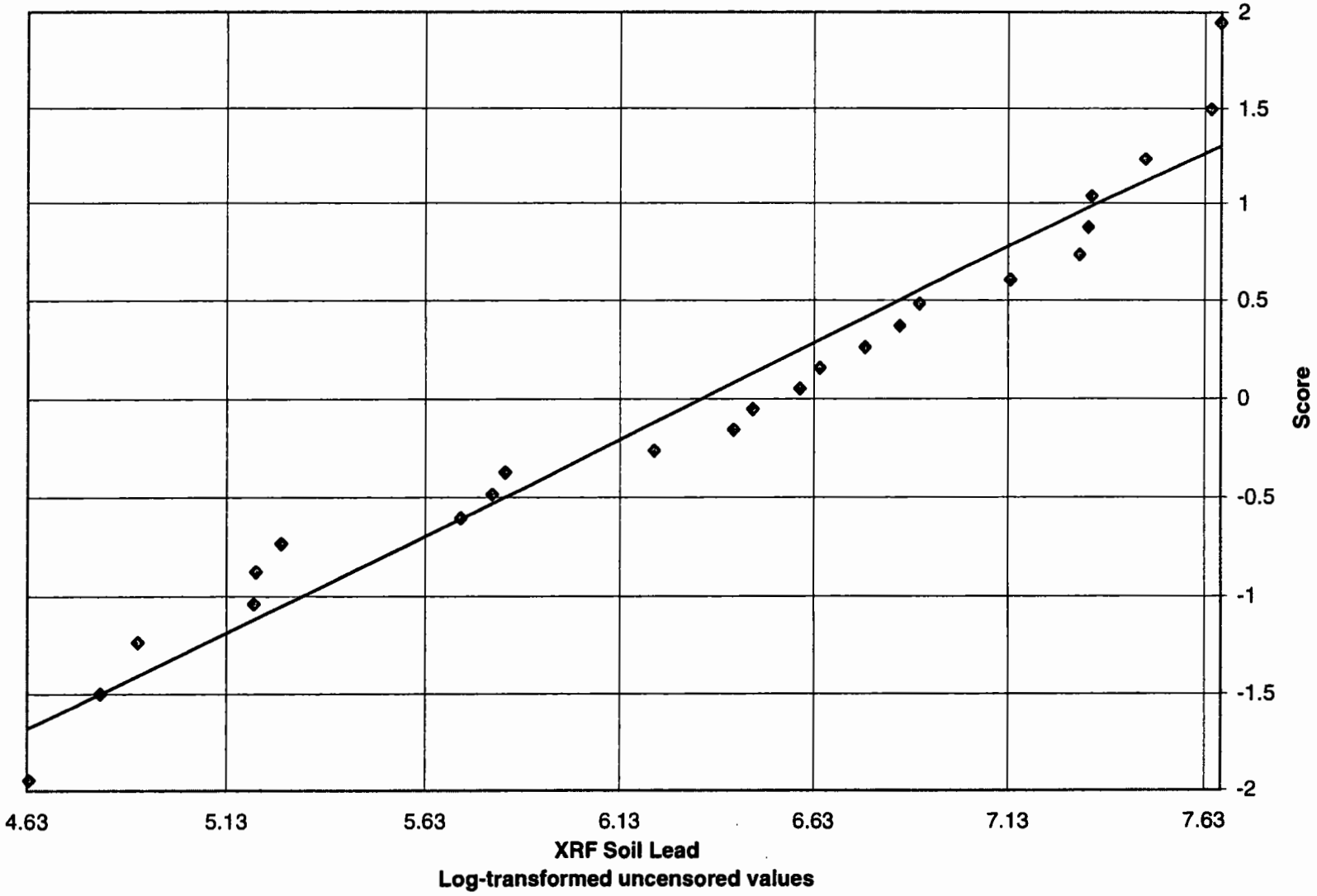


Mare Island Lead Based Paint Survey
Building 396 XRF Soil Lead Summary Statistics

Conc. (mg/kg)						
123	J	Number of samples	24	Uncensored values		
182		Uncensored	24	Mean	825.38	
995		Censored	0	Lognormal mean	900.65	
647		Detection limit or PQL	50	Std. devn.	646.352294	
1549		Method detection limit		Median	688.5	
502		TOTAL	24	Min.	103	
769				Max.	2142	
1501						
1256						
341		Lognormal distribution?		Normal distribution?		
194		r-squared is:	0 950	r-squared is:	0.913	
103	J	Recommendations:				
945		Assume lognormal distribution.				
305		W value is 0.9327. This exceeds the tabled value of 0.916				
330						
135						
730						
181						
2142						
2090		UCL (Land's method) is 1476.13				
1773						
1536						
864						
616						

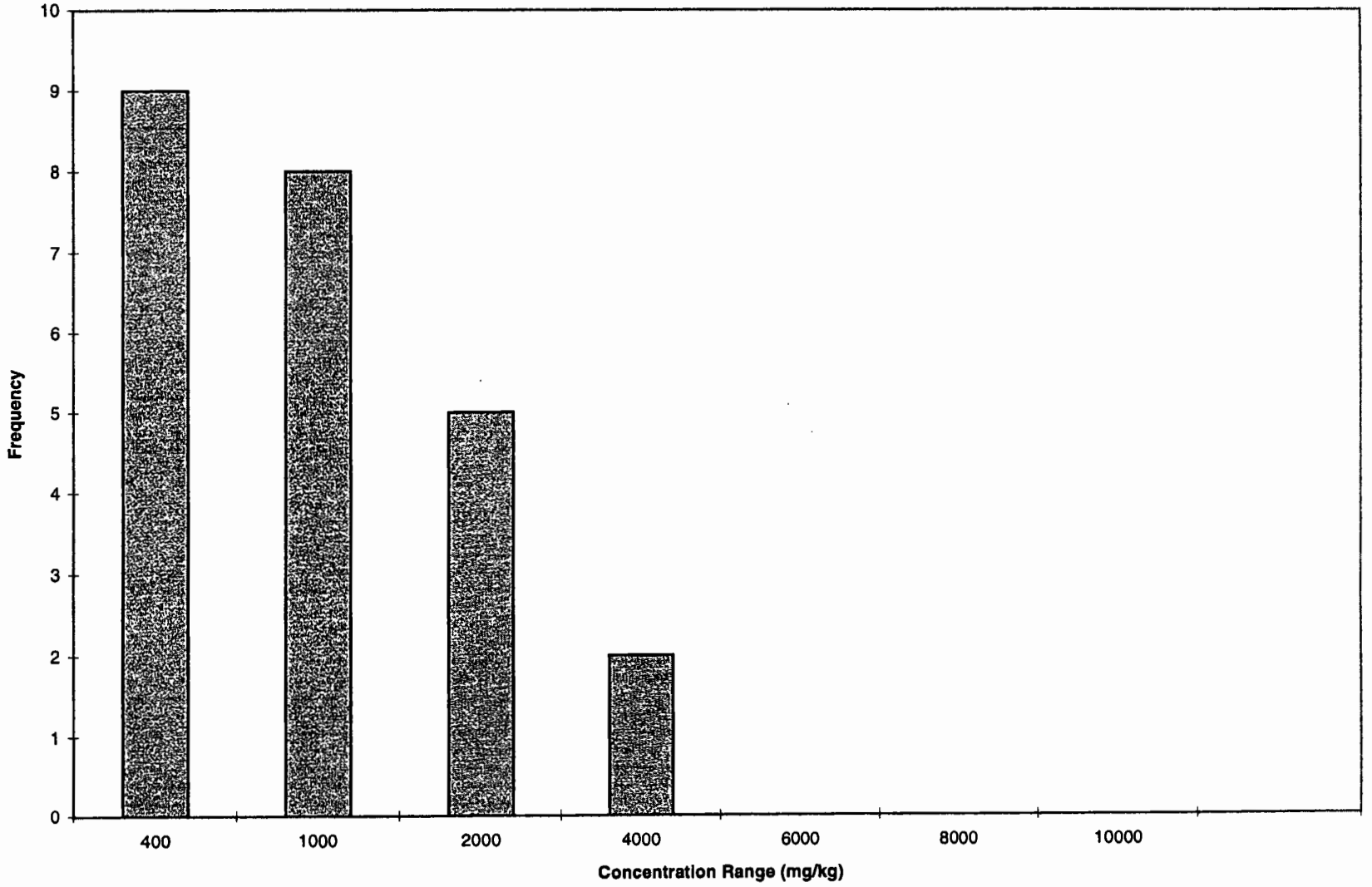
Mare Island Lead Based Paint Survey
Building 396 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



396XRFP.XLS

Mare Island Lead Based Paint Survey
Building 396 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 396 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
216.38
264.49
927.49
643.7
1379.3
525.45
743.19
1340.1
1140.3
394.16
274.28
200.07
886.72
364.8
385.19
226.16
711.39
263.68
1862.9
1820.5
1562
1368.7
820.66
618.42

Number of samples	24	Uncensored values	
Uncensored	24	Mean	789.16
Censored	0	Lognormal mean	811.64
Detection limit or PQL	50	Std. devn.	527.100296
Method detection limit		Median	677.54175
TOTAL	24	Min.	200.0665
		Max.	1862.871

Lognormal distribution?		Normal distribution?	
r-squared is:	0.955	r-squared is:	0.913

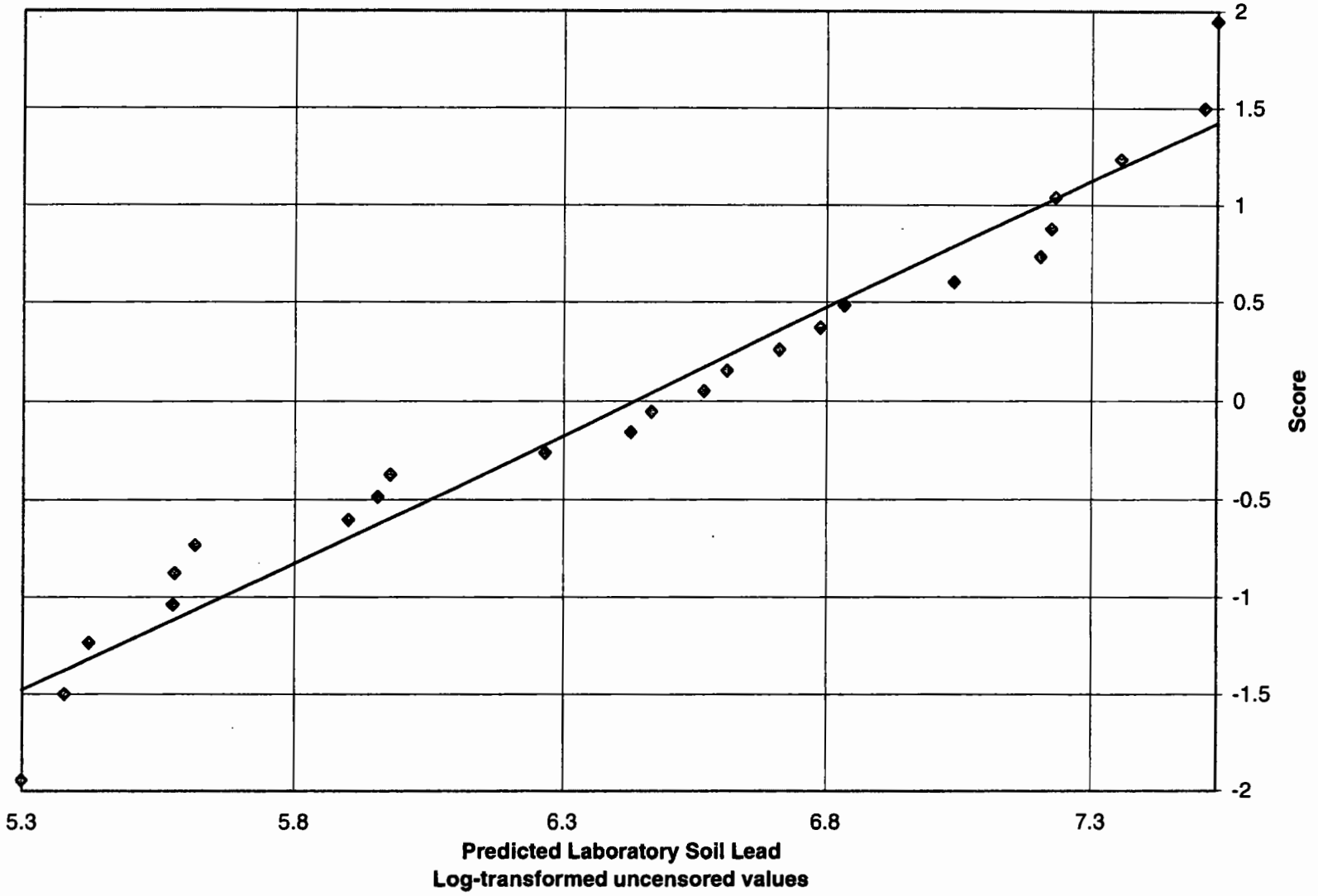
Recommendations:
Assume lognormal distribution.
W value is 0.9352. This exceeds the tabled value of 0.916

UCL (Land's method) is 1130.4

Predicted laboratory concentration calculated from regression equation

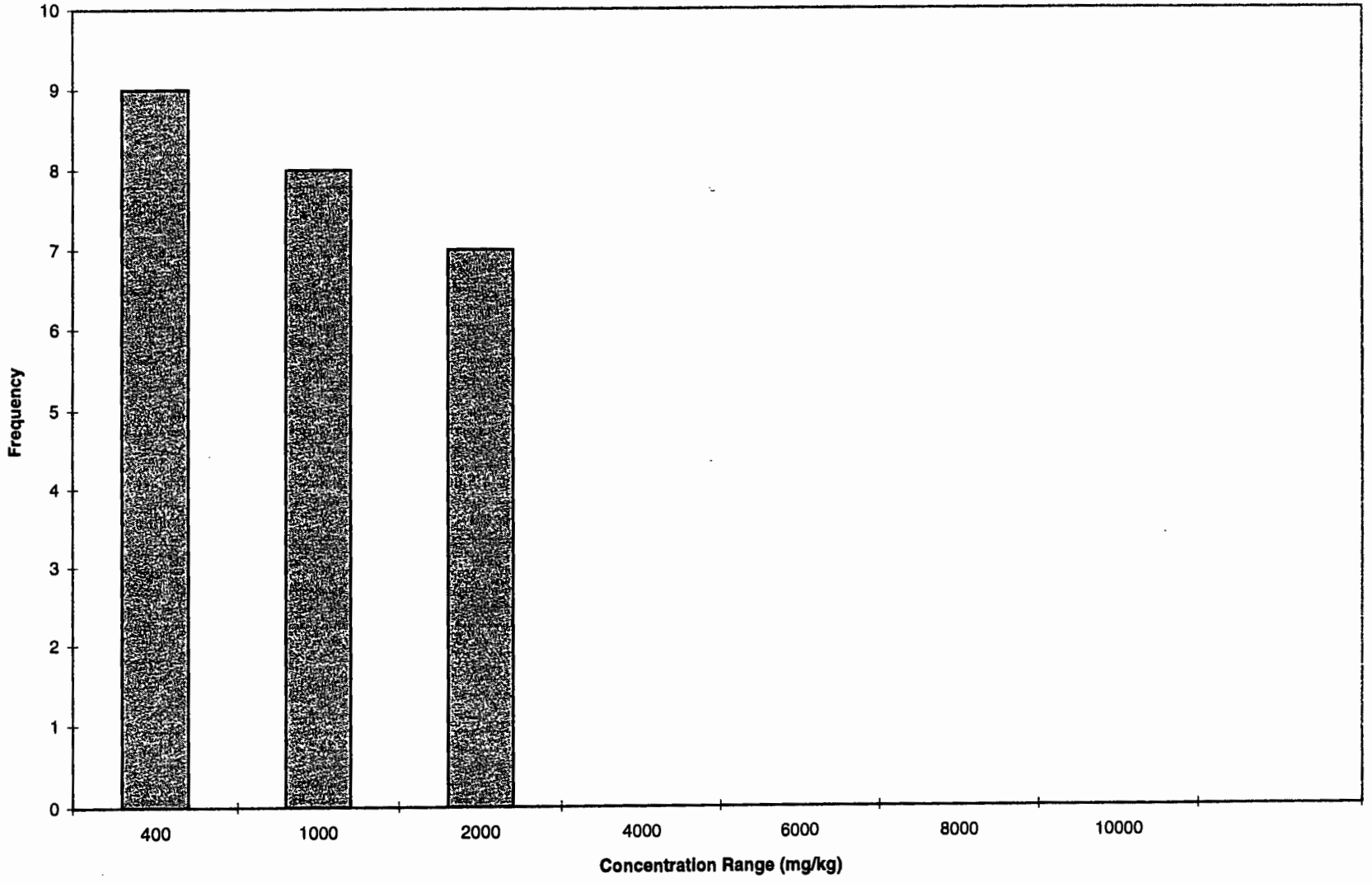
Mare Island Lead Based Paint Survey
Building 396 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



396LABP.XLS

Mare Island Lead Based Paint Survey
Building 396 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 571 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
52
55
55
60
68
88
89
93
104
104
171
177
219
227
264
316
333
348
445
564
834
998
1023
1126
1519
1851
2024
2102
9600
<50
<50

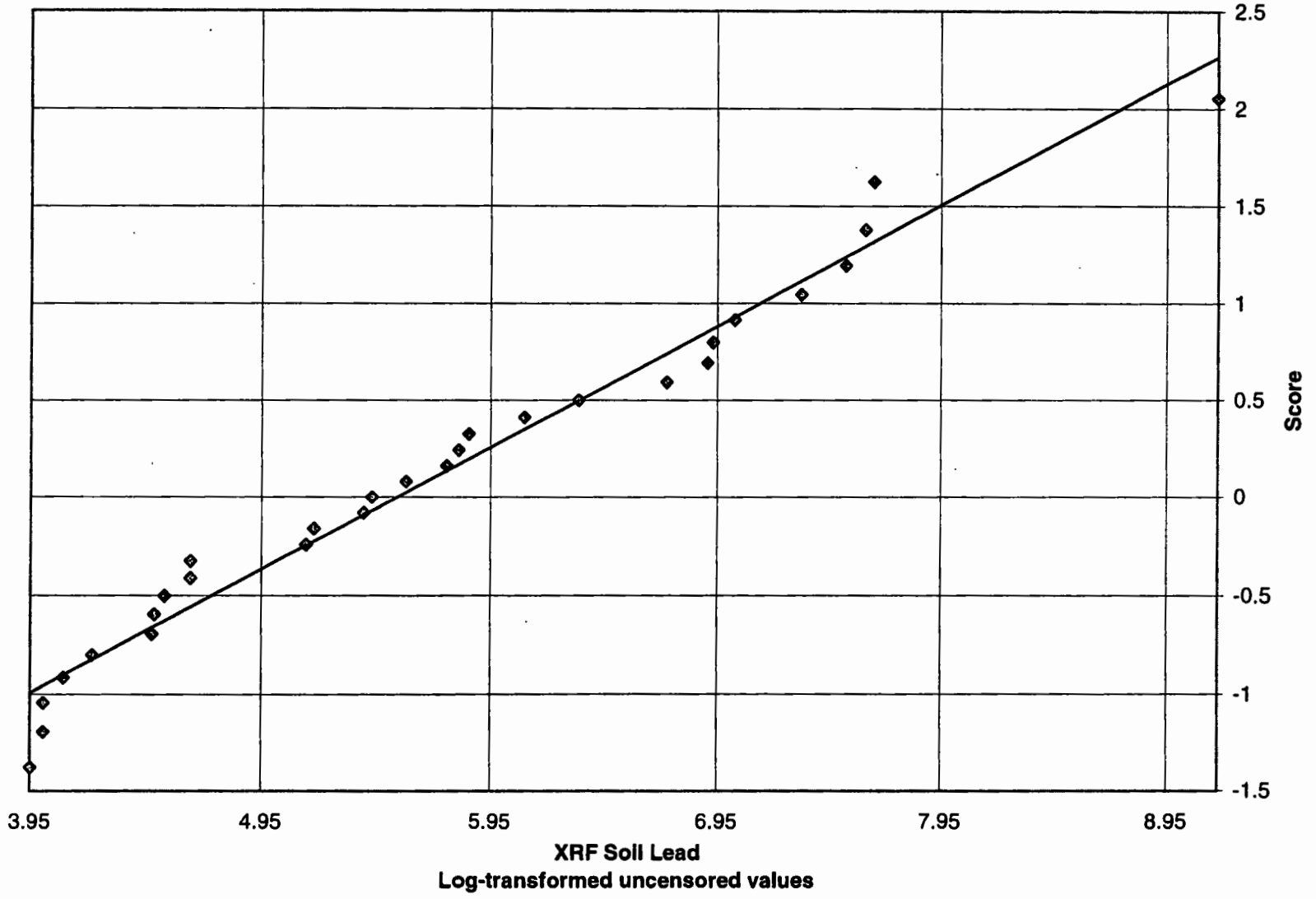
Number of samples		31	Uncensored values		
Uncensored		29	Mean		858.93
Censored		2	Lognormal mean		797.96
Detection limit or PQL		50	Std. devn.		1794.43628
Method detection limit			Median		264
TOTAL		31	Min.		52
			Max.		9600
Lognormal distribution?			Normal distribution?		
r-squared is:	0.974		r-squared is:	0.464	

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1750.03
Simple substitution used with censored values.

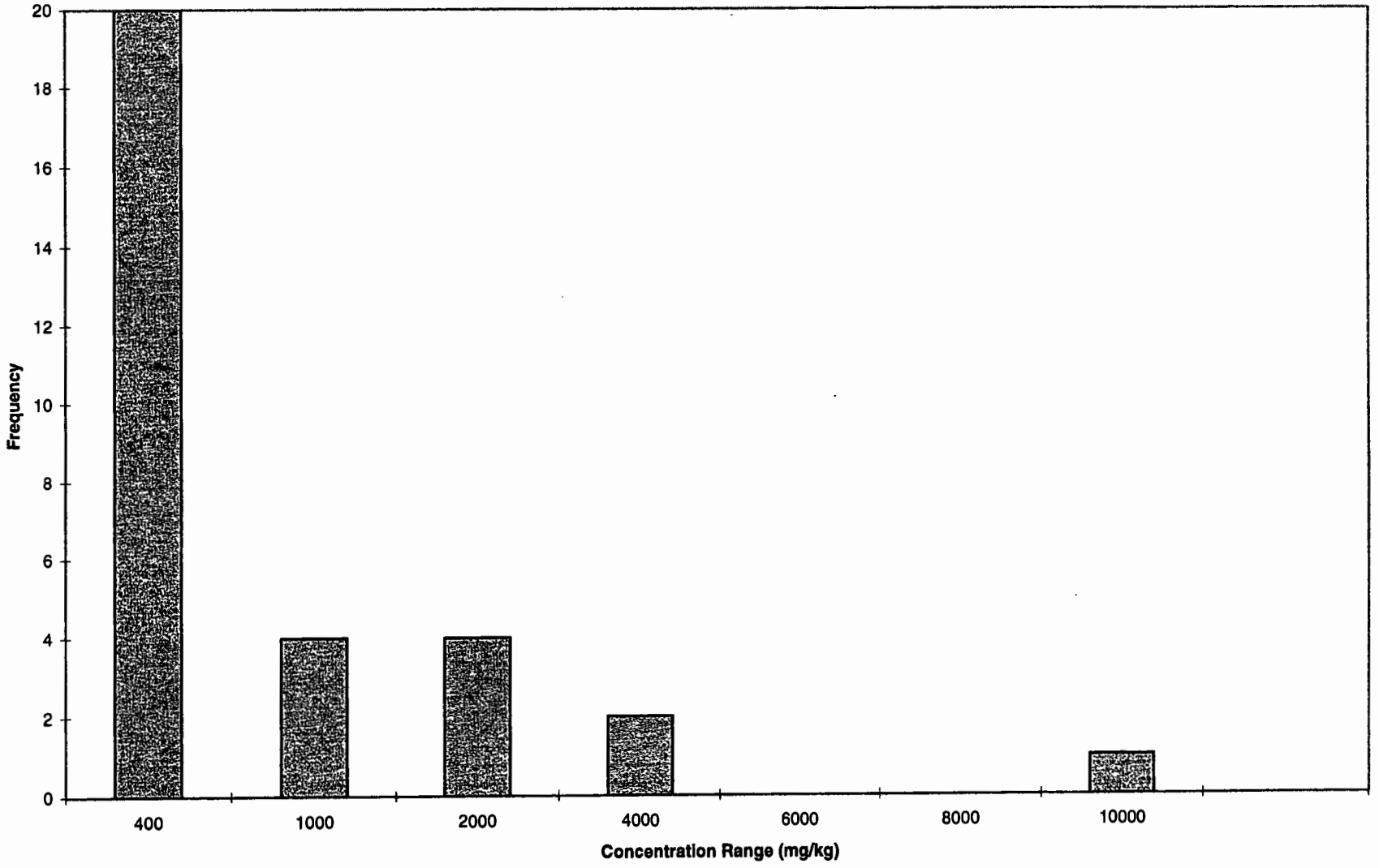
Mare Island Lead Based Paint Survey
Building 571 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



571xrfp.xls

Mare Island Lead Based Paint Survey
Building 571 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 571 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
158.48
160.92
160.92
165
171.52
187.83
188.65
191.91
200.88
200.88
255.52
260.41
294.66
301.19
331.36
373.77
387.63
399.86
478.97
576.01
796.2
929.94
950.33
1034.3
1354.8
1625.6
1766.6
1830.3
7944.9
<150
<150

Number of samples	31	Uncensored values	
Uncensored	29	Mean	816.53
Censored	2	Lognormal mean	708.77
Detection limit or PQL	150	Std. devn.	1463.36279
Method detection limit		Median	331.362
TOTAL	31	Min.	158.476
		Max.	7944.87

Lognormal distribution?		Normal distribution?	
r-squared is:	0.924	r-squared is:	0.464

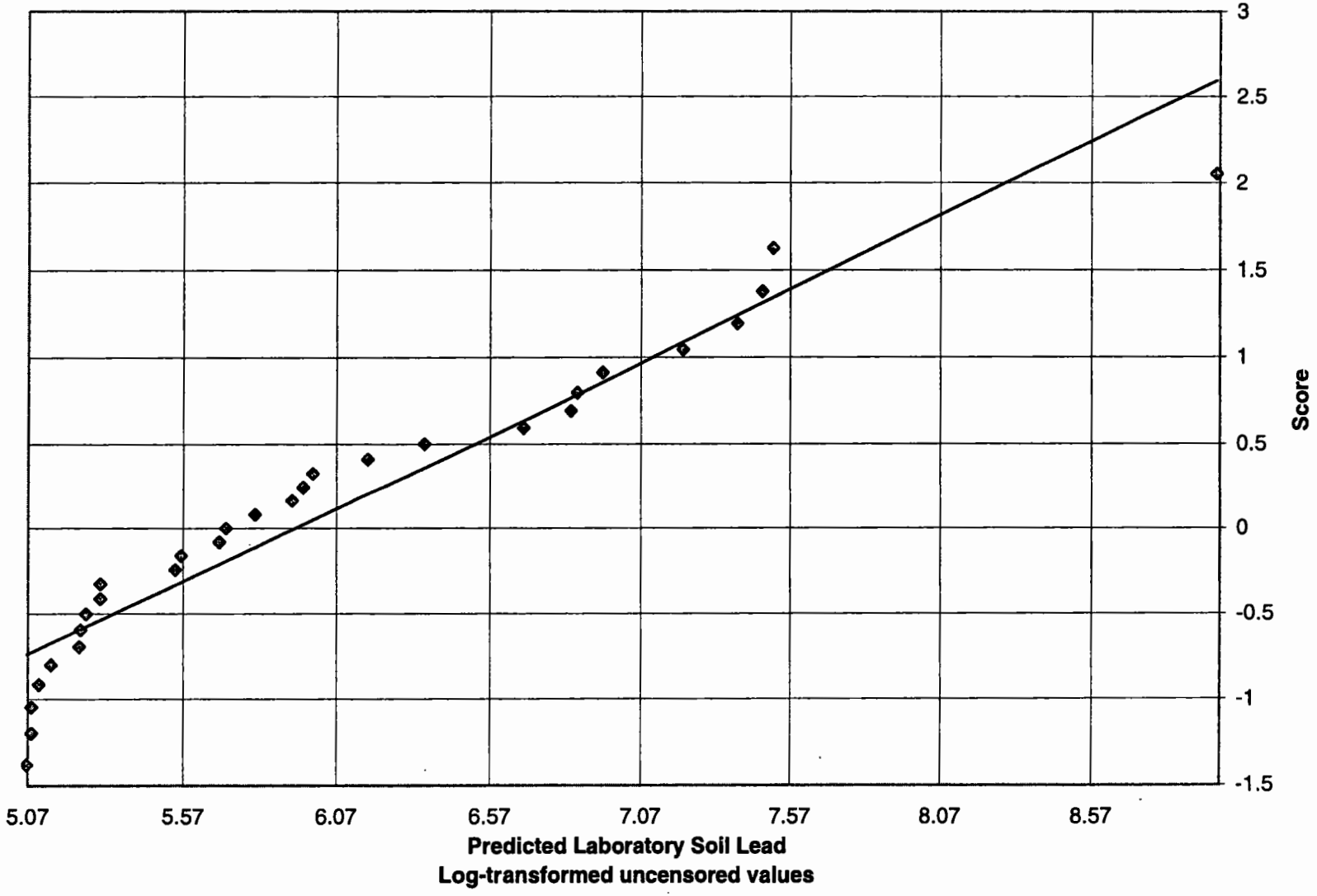
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1083.13
Simple substitution used with censored values.

Predicted laboratory concentration calculated from regression equation

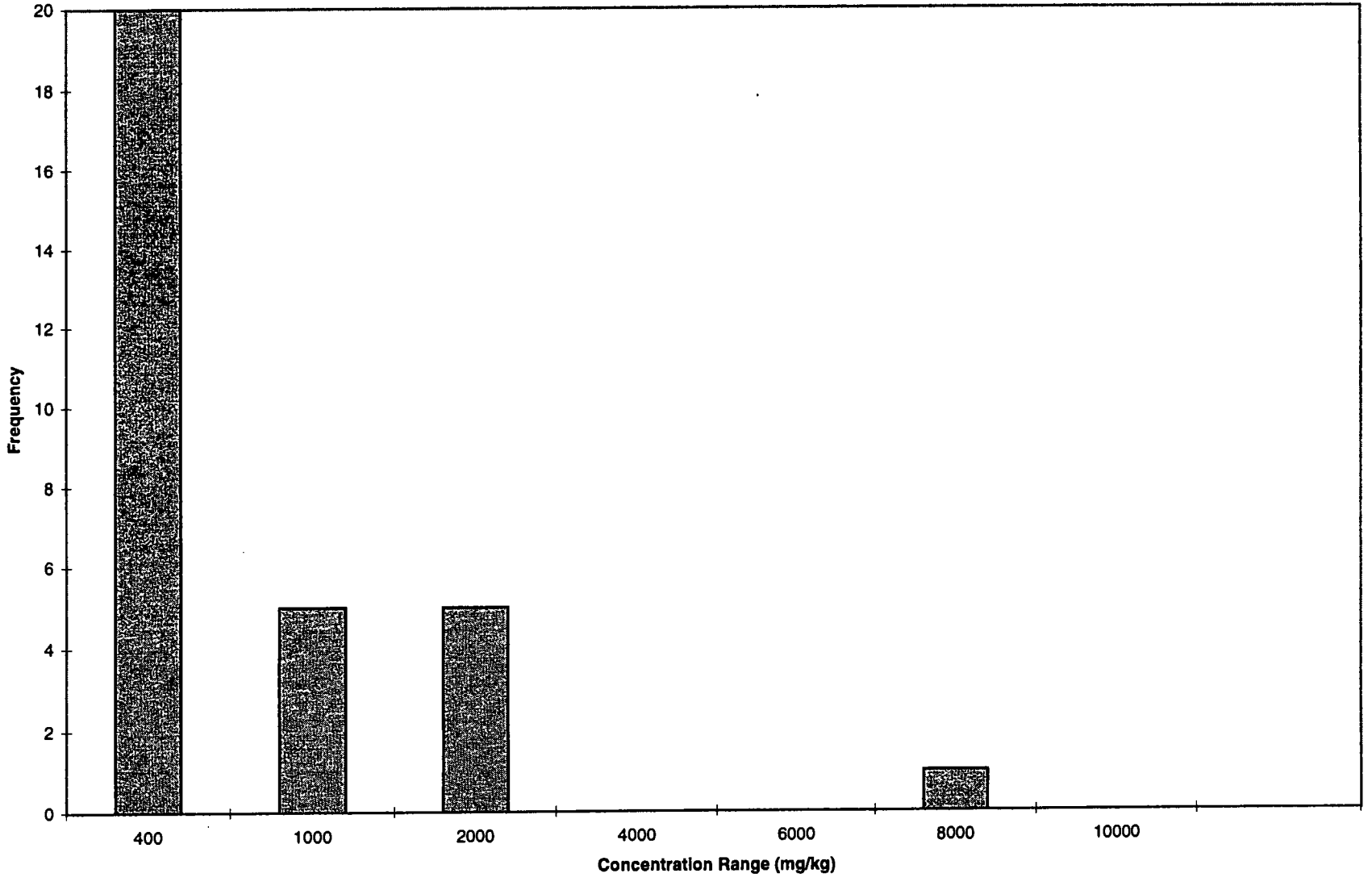
Mare Island Lead Based Paint Survey
Building 571 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



571LABP.XLS

Mare Island Lead Based Paint Survey
Building 571 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Base Paint Survey
Building 617 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
147
156
1282
708
81
132

Number of samples	6	Uncensored values	
Uncensored	6	Mean	417.67
Censored	0	Lognormal mean	445.73
Detection limit or PQL	50	Std. devn.	483.331218
Method detection limit		Median	151.5
TOTAL	6	Min.	81
		Max.	1282

Lognormal distribution?		Normal distribution?	
r-squared is:	0.862	r-squared is:	0.746

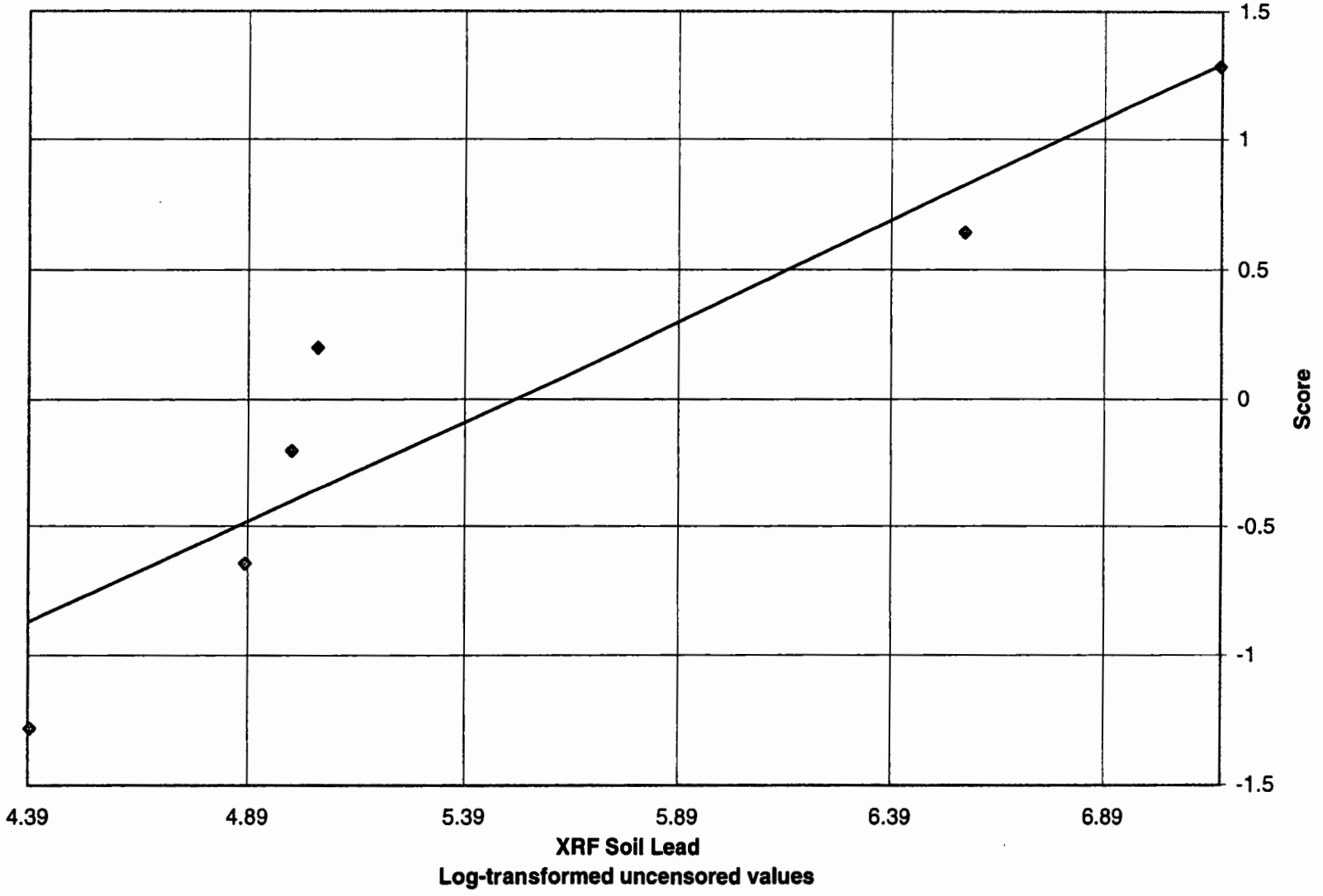
Recommendations:
Assume lognormal distribution.
W value is 0.8547. This exceeds the tabled value of 0.788

UCL (Land's method) is 3872.8

Statistics may not be reliable due to small number of samples

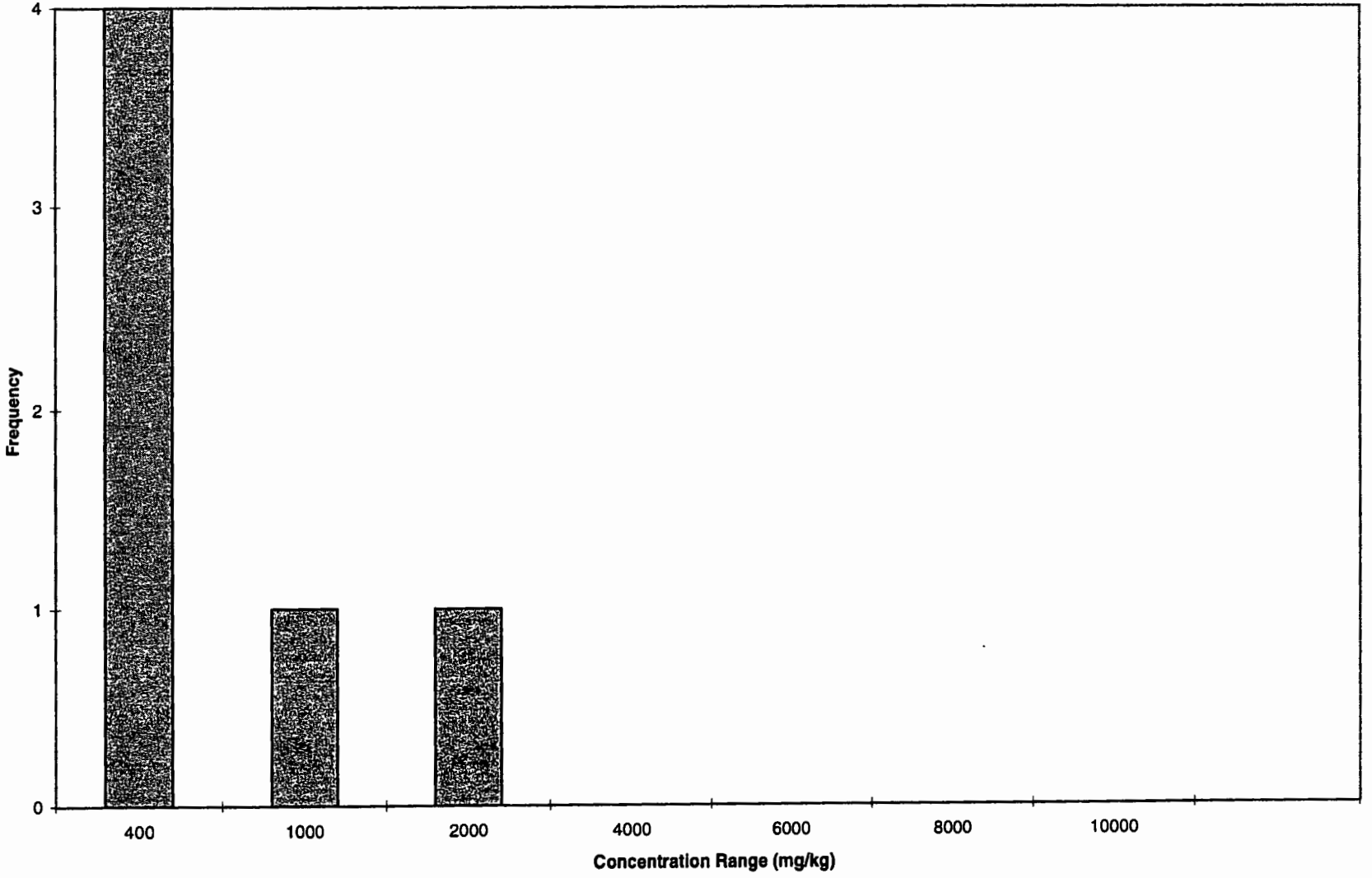
Mare Island Lead Based Paint Survey
Building 617 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



617XRFP.XLS

Mare Island Lead Based Paint Survey
Building 617 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 617 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
235.95
243.29
1161.5
693.44
182.13
223.72

Number of samples	6	Uncensored values	
Uncensored	6	Mean	456.68
Censored	0	Lognormal mean	465.98
Detection limit or PQL	150	Std. devn.	394.156609
Method detection limit		Median	239.61825
TOTAL	6	Min.	182.1255
		Max.	1161.541

Lognormal distribution?		Normal distribution?	
r-squared is:	0.817	r-squared is:	0.746

Recommendations:
Assume lognormal distribution.
W value is 0.81. This exceeds the tabled value of 0.788

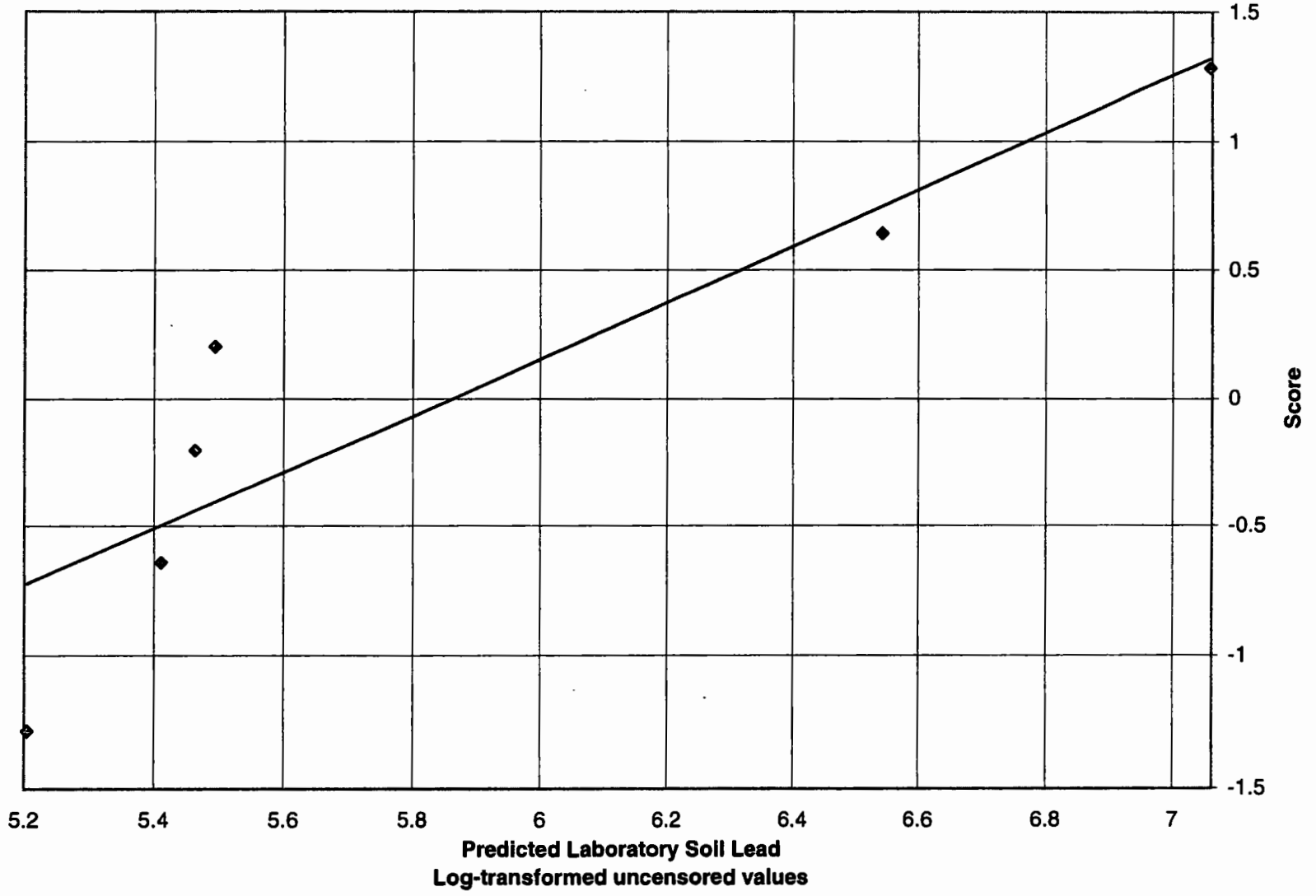
UCL (Land's method) is 1425.47

Statistics may not be reliable due to small number of samples

Predicted laboratory concentration calculated from regression equation

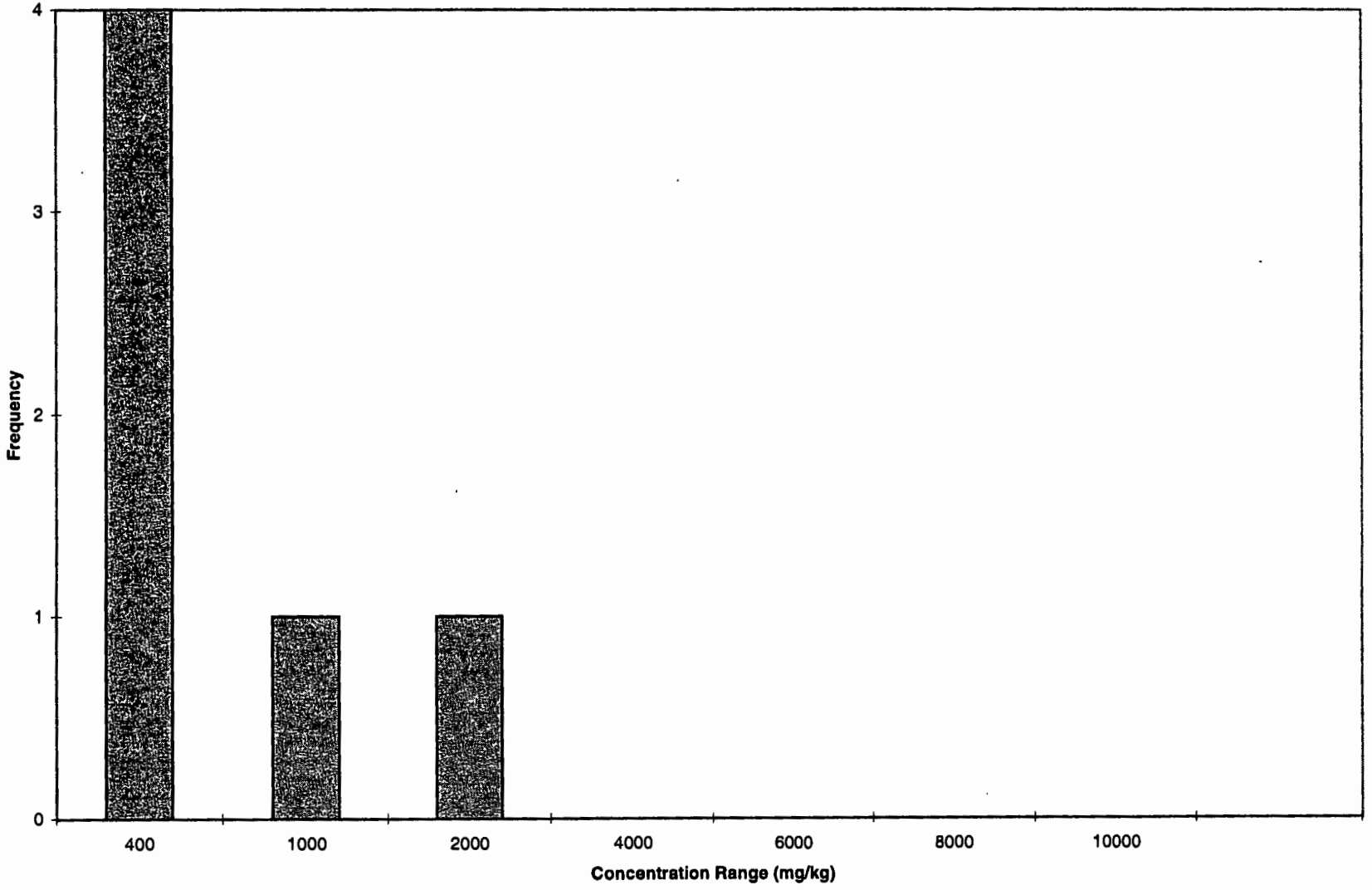
Mare Island Lead Based Paint Survey
Building 617 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



617LABP.XLS

Mare Island Lead Based Paint Survey
Building 617 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 621 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
288
176
362
316
158
165
174
374
721
501
705
527
429
363
553
143
350
325
454
647
311
404
210
279
790
585
976
697
630
403
764
419
276
272
312
344
93
231

Number of samples	42	Uncensored values	
Uncensored	42	Mean	414.71
Censored	0	Lognormal mean	419.85
Detection limit or PQL	50	Std. devn.	207.616824
Method detection limit		Median	362.5
TOTAL	42	Min.	93
		Max.	976

Lognormal distribution?		Normal distribution?	
r-squared is:	0.982	r-squared is:	0.948

Recommendations:

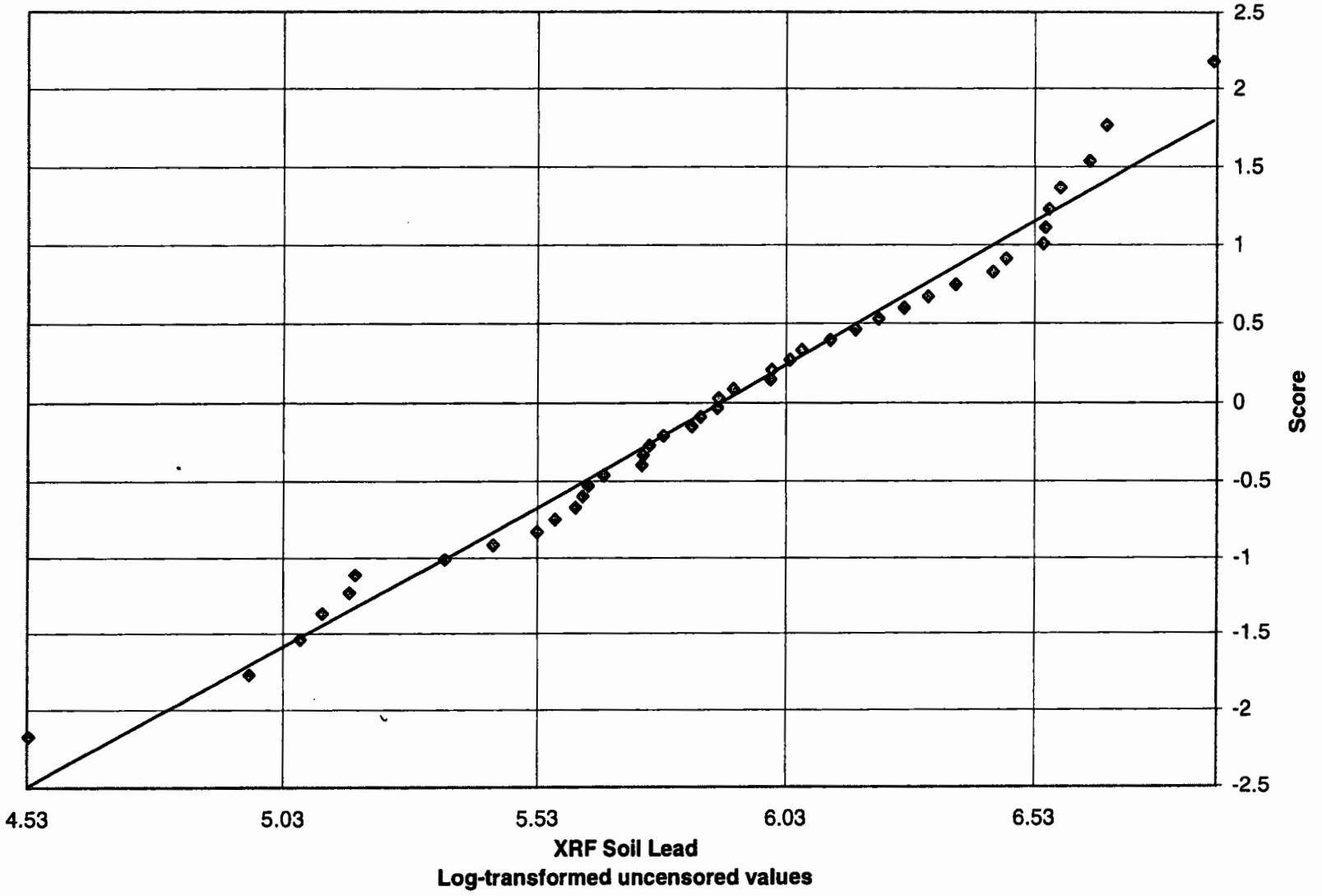
Assume lognormal distribution.

W value is 0.9768. This exceeds the tabled value of 0.942

UCL (Land's method) is 492.54

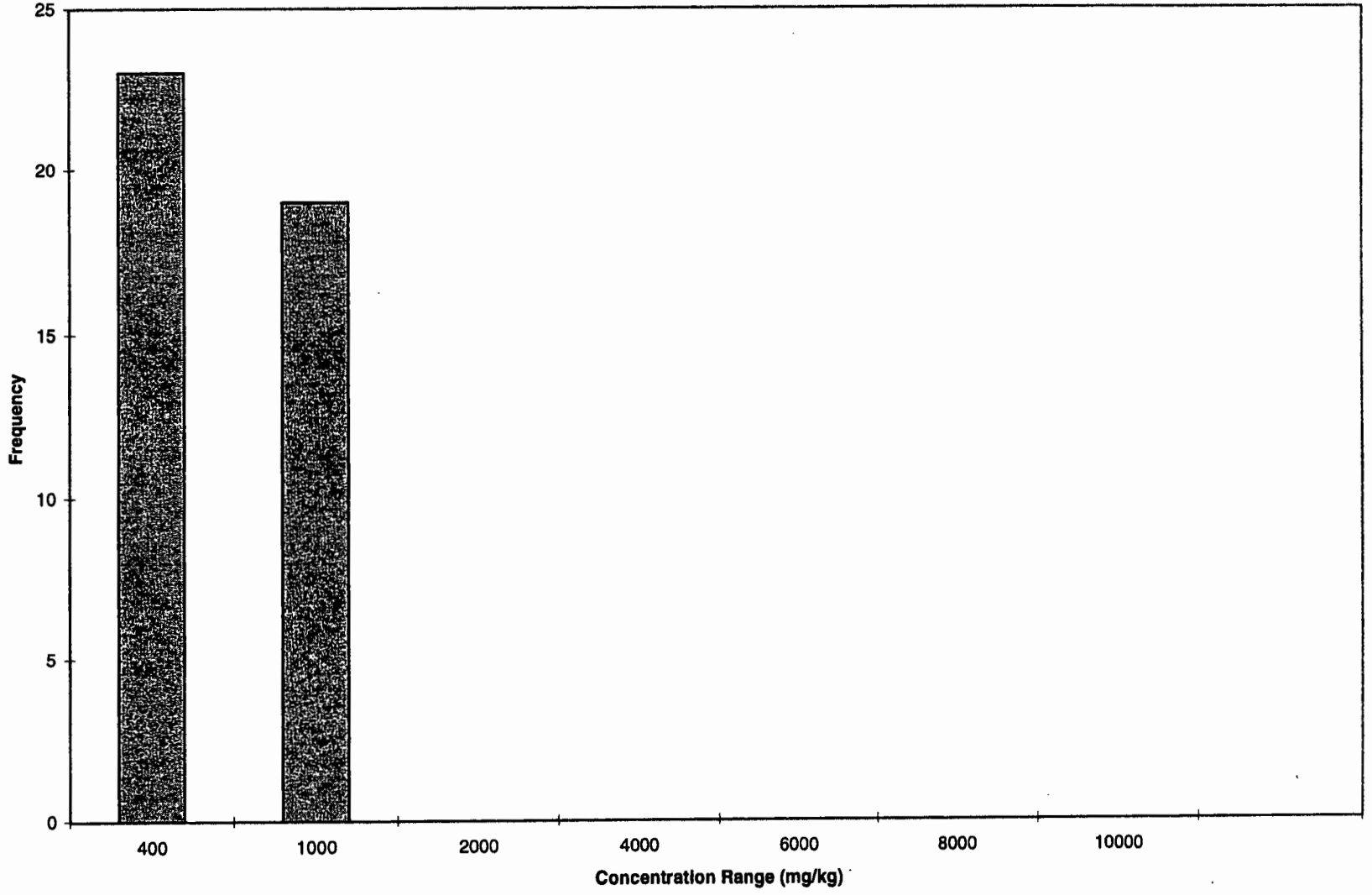
Mare Island Lead Based Paint Survey
Building 621 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



621XRFP.XLS

Mare Island Lead Based Paint Survey
Building 621 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 621 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
350.93
259.6
411.28
373.77
244.92
250.63
257.97
421.07
704.05
524.64
691
545.84
465.92
412.1
567.04
232.69
401.5
381.11
486.31
643.7
369.69
445.53
287.33
343.59
760.32
593.14
912
684.47
629.84
444.72
739.11
457.76
341.15
337.89
370.51
396.6
191.91
304.45

Number of samples	42	Uncensored values	
Uncensored	42	Mean	454.27
Censored	0	Lognormal mean	455.19
Detection limit or PQL	150	Std. devn.	169.31152
Method detection limit		Median	411.68875
TOTAL	42	Min.	191.9115
		Max.	911.998

Lognormal distribution?		Normal distribution?	
r-squared is:	0.988	r-squared is:	0.948

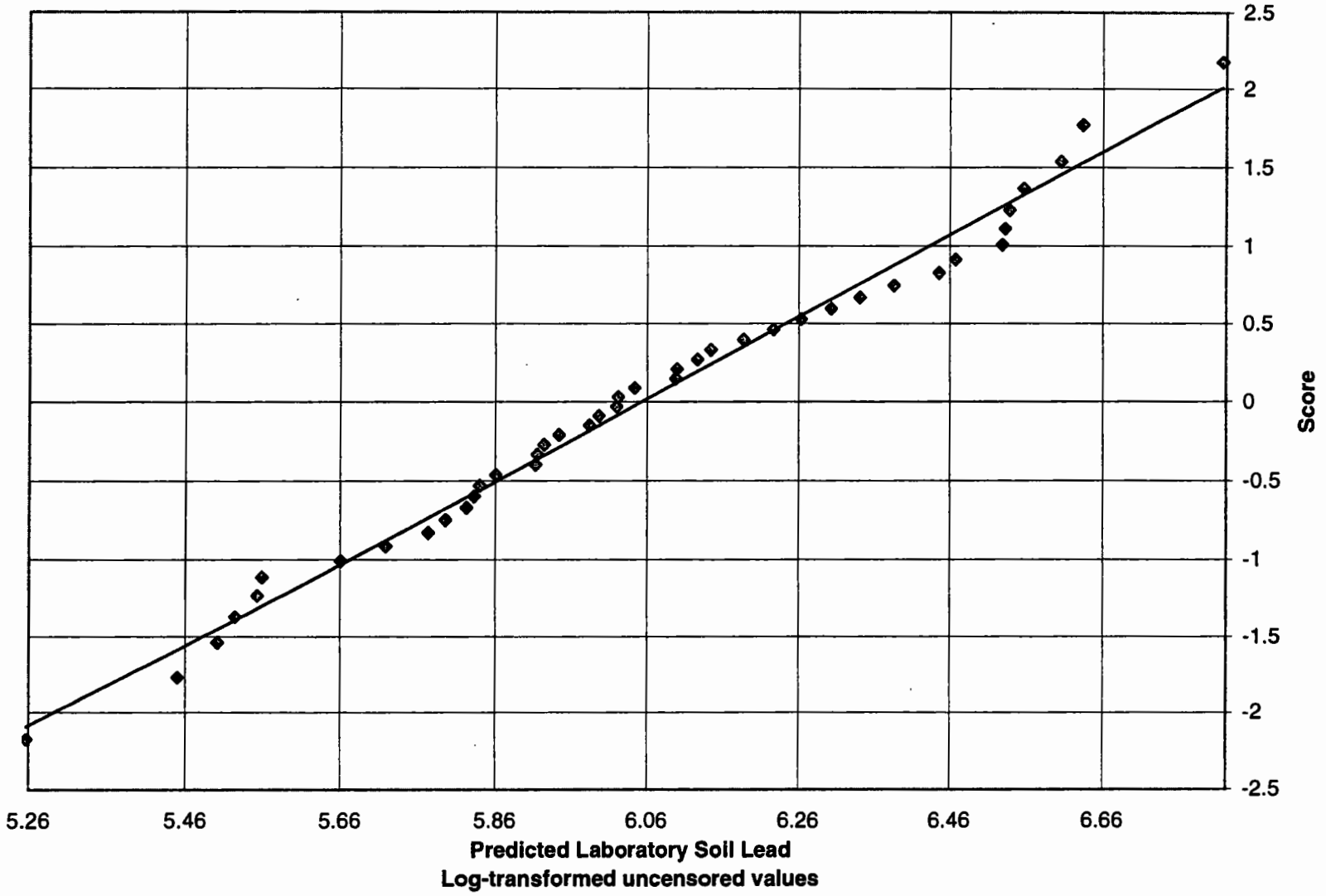
Recommendations:
Assume lognormal distribution.
W value is 0.9788. This exceeds the tabled value of 0.942

UCL (Land's method) is 505.49

Predicted laboratory concentration calculated from regression equation

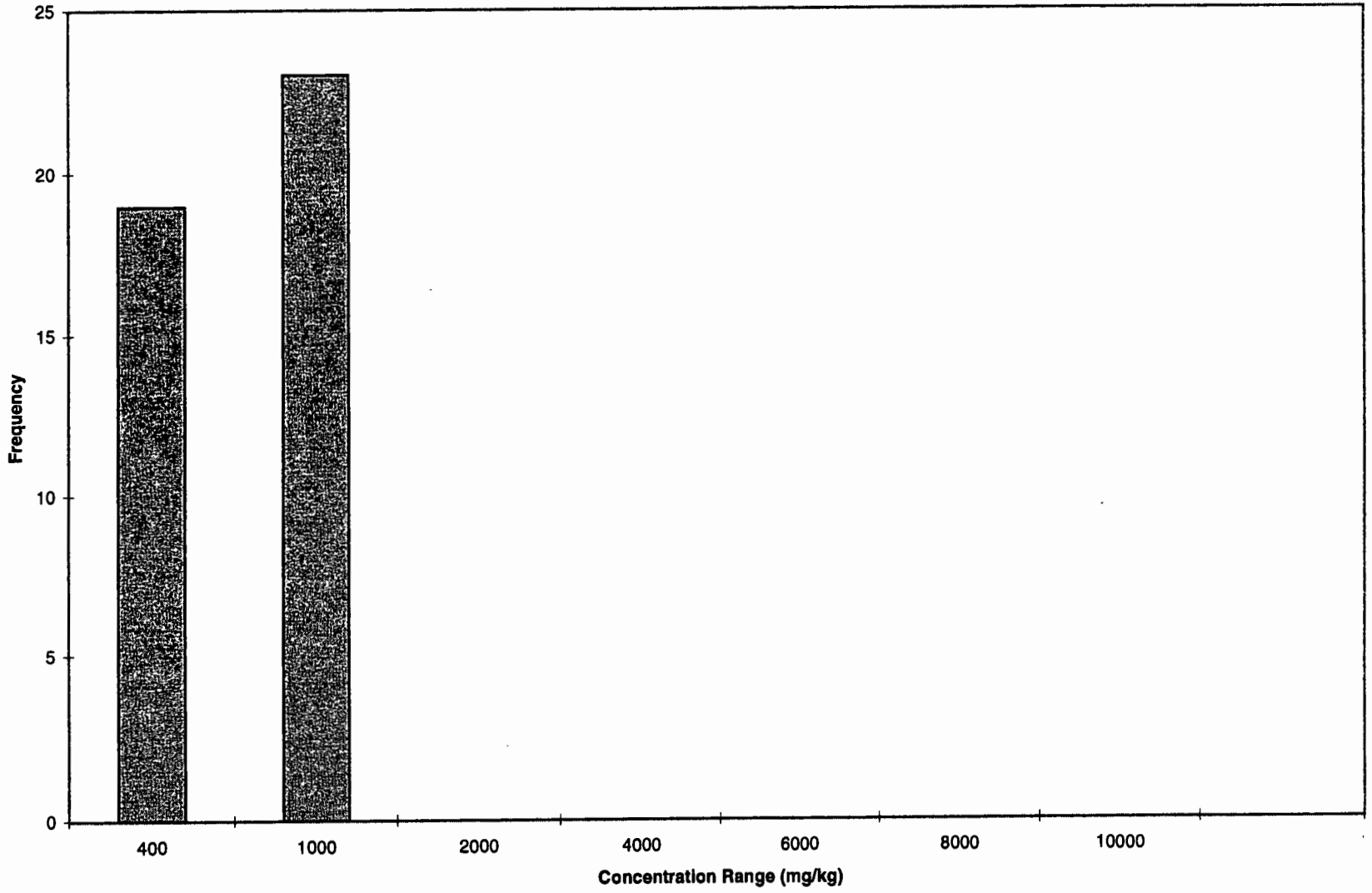
Mare Island Lead Based Paint Survey
Building 621 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



621LABP.XLS

Mare Island Lead Based Paint Survey
Building 621 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 650 XRF Soil Lead Summary Statistics

Conc. (mg/kg)		
51	J	
57	J	
61	J	
67	J	
<50		
<50		
<50		
<50		

Number of samples	8	Uncensored values		
Uncensored	4	Mean	59.00	
Censored	4	Lognormal mean	59.10	
Detection limit or PQL	50	Std. devn.	6.73300329	
Method detection limit		Median	59	
TOTAL	8	Min.	51	
		Max.	67	

Lognormal distribution?		Normal distribution?	
r-squared is:	0.966	r-squared is:	0.979

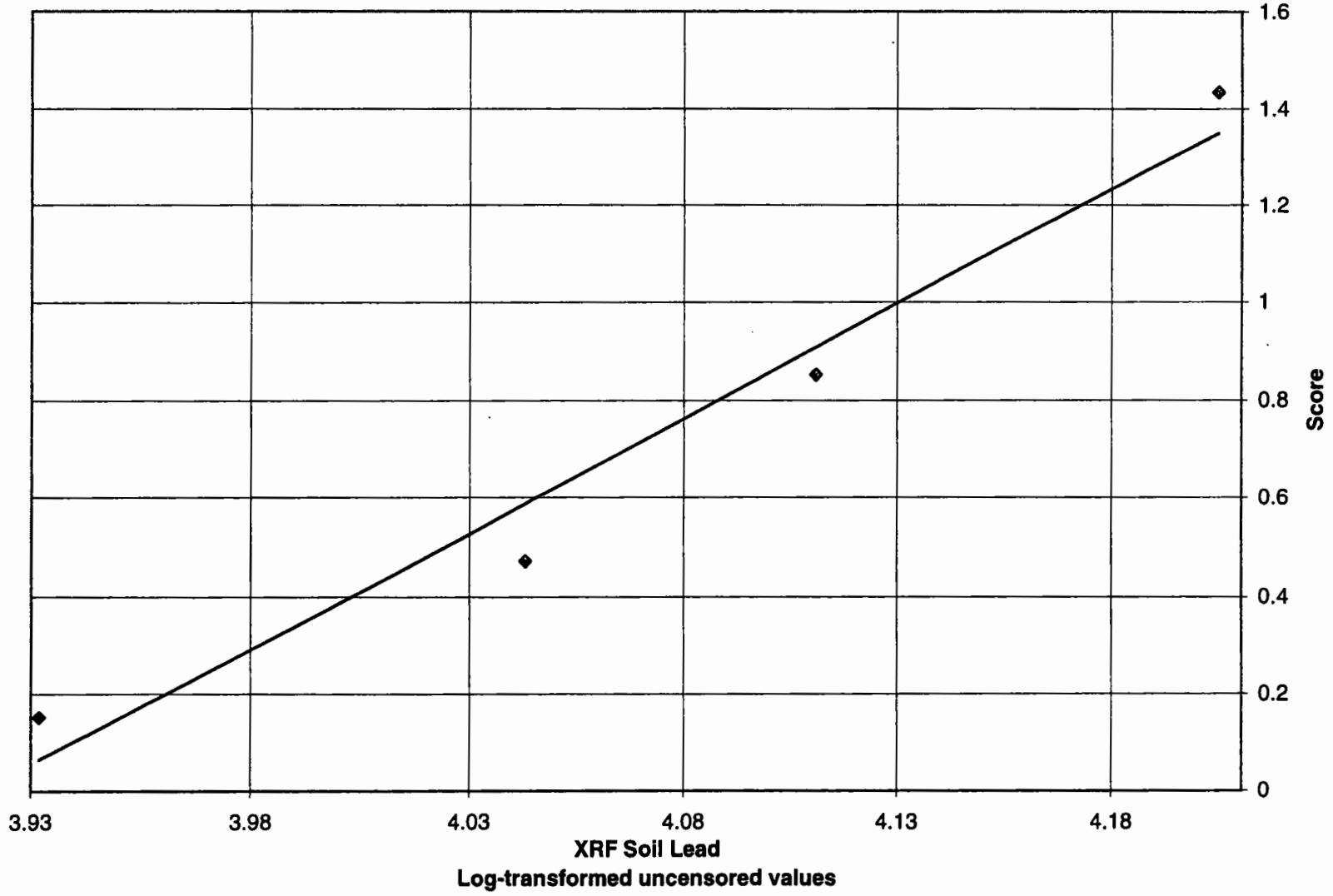
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 59.01
Cohen's method applied.

Statistics may not be reliable due to small number of samples

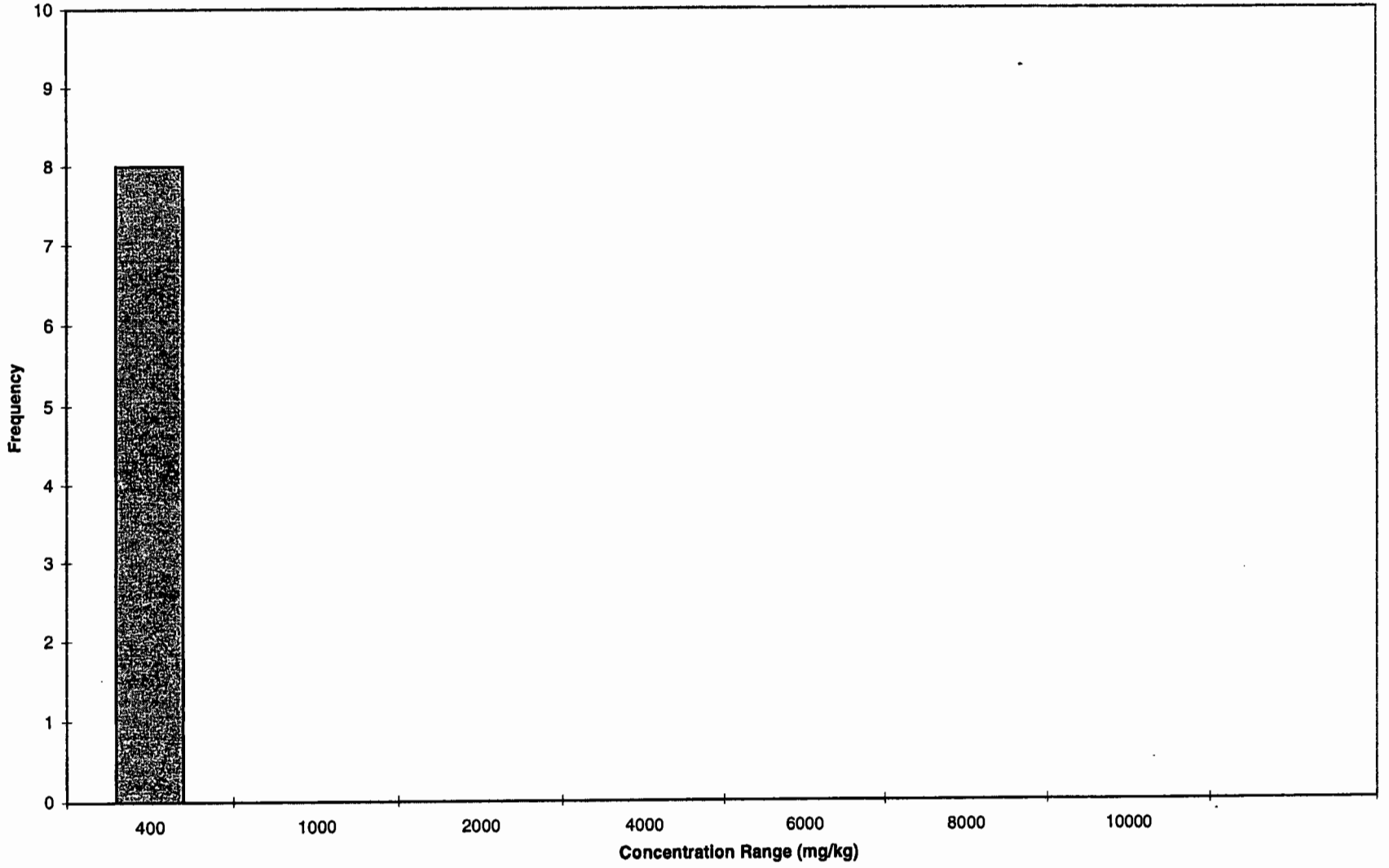
Mare Island Lead Based Paint Survey
Building 650 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



650XRFP.XLS

Mare Island Lead Based Paint Survey
Building 650 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 650 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
157.66
162.55
165.82
170.71
<150
<150
<150
<150

Number of samples	8	Uncensored values	
Uncensored	4	Mean	164.18
Censored	4	Lognormal mean	164.21
Detection limit or PQL	150	Std. devn.	5.49076418
Method detection limit		Median	164.1845
TOTAL	8	Min.	157.6605
		Max.	170.7085

Lognormal distribution?		Normal distribution?	
r-squared is:	0.976	r-squared is:	0.979

Recommendations:
Use lognormal distribution.

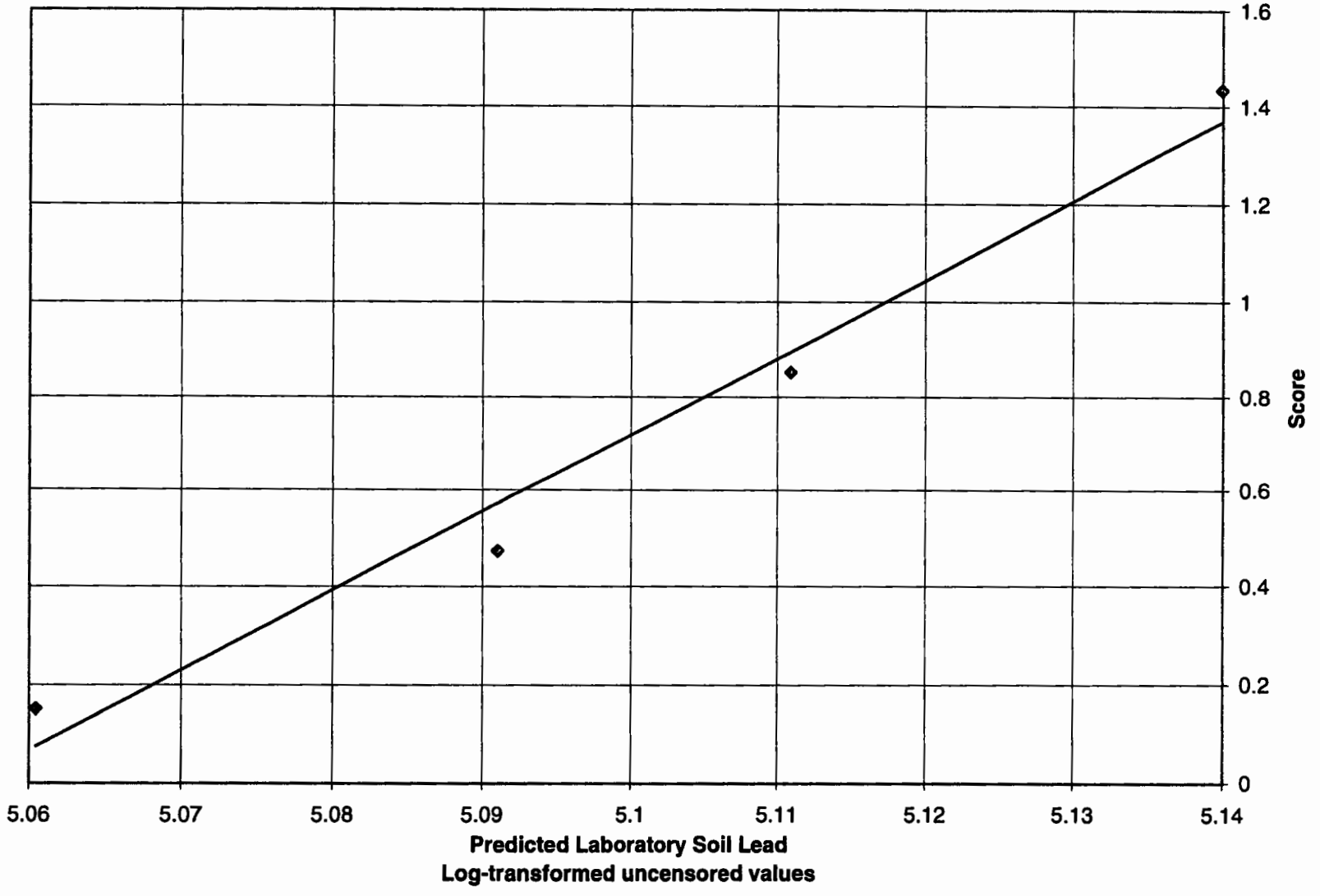
UCL (Land's method) is 162.15
Cohen's method applied.

Statistics may not be reliable due to small number of samples

Predicted laboratory concentrations calculated from regression equation

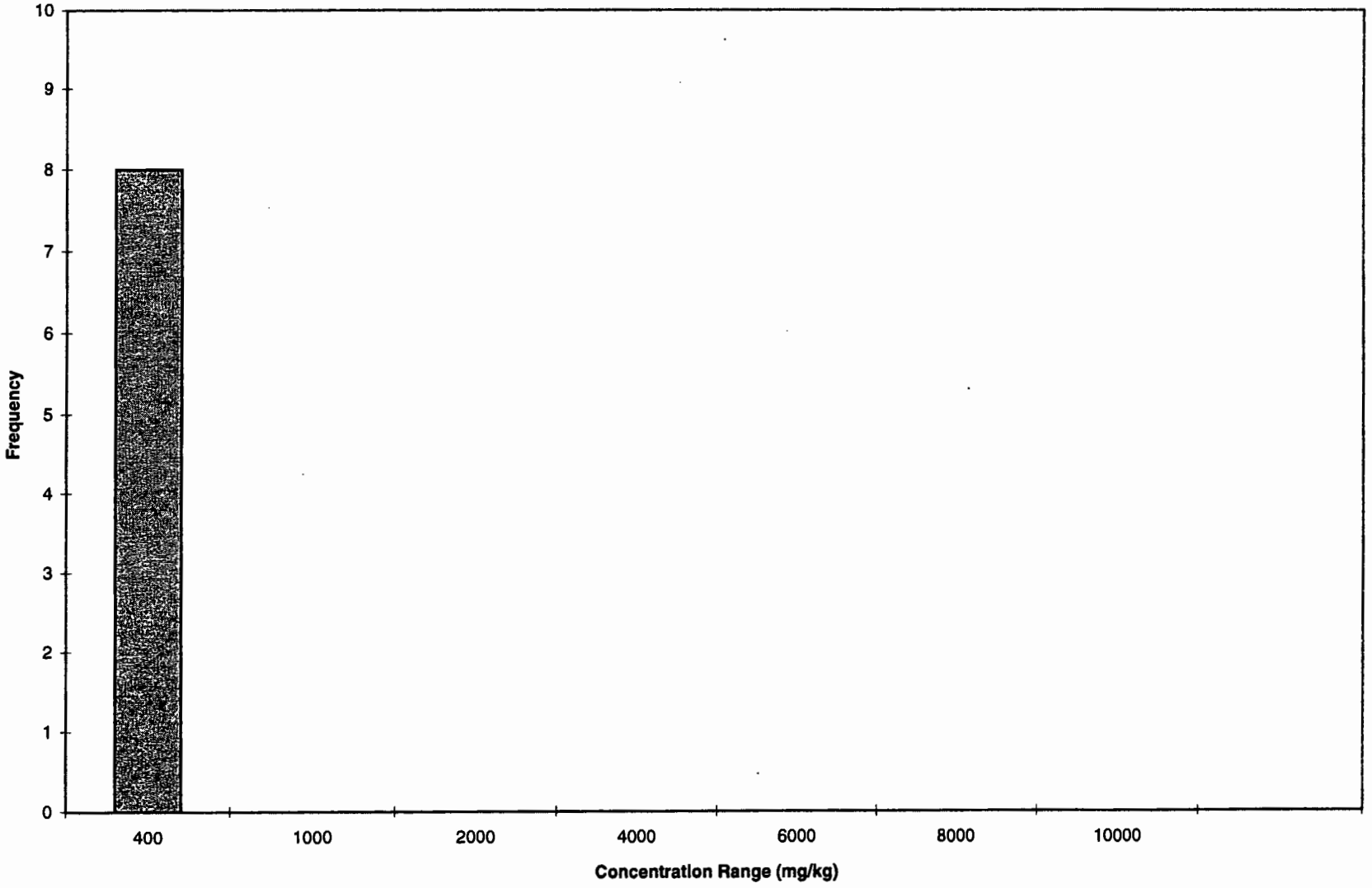
Mare Island Lead Based Paint Survey
Building 650 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



650LABP.XLS

Mare Island Lead Based Paint Survey
Building 650 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 653 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
453
444
141
263
239
585

Number of samples	6	Uncensored values	
Uncensored	6	Mean	354.17
Censored	0	Lognormal mean	365.83
Detection limit or PQL	50	Std. devn.	166.214821
Method detection limit		Median	353.5
TOTAL	6	Min.	141
		Max.	585

Lognormal distribution?		Normal distribution?	
r-squared is:	0.942	r-squared is:	0.953

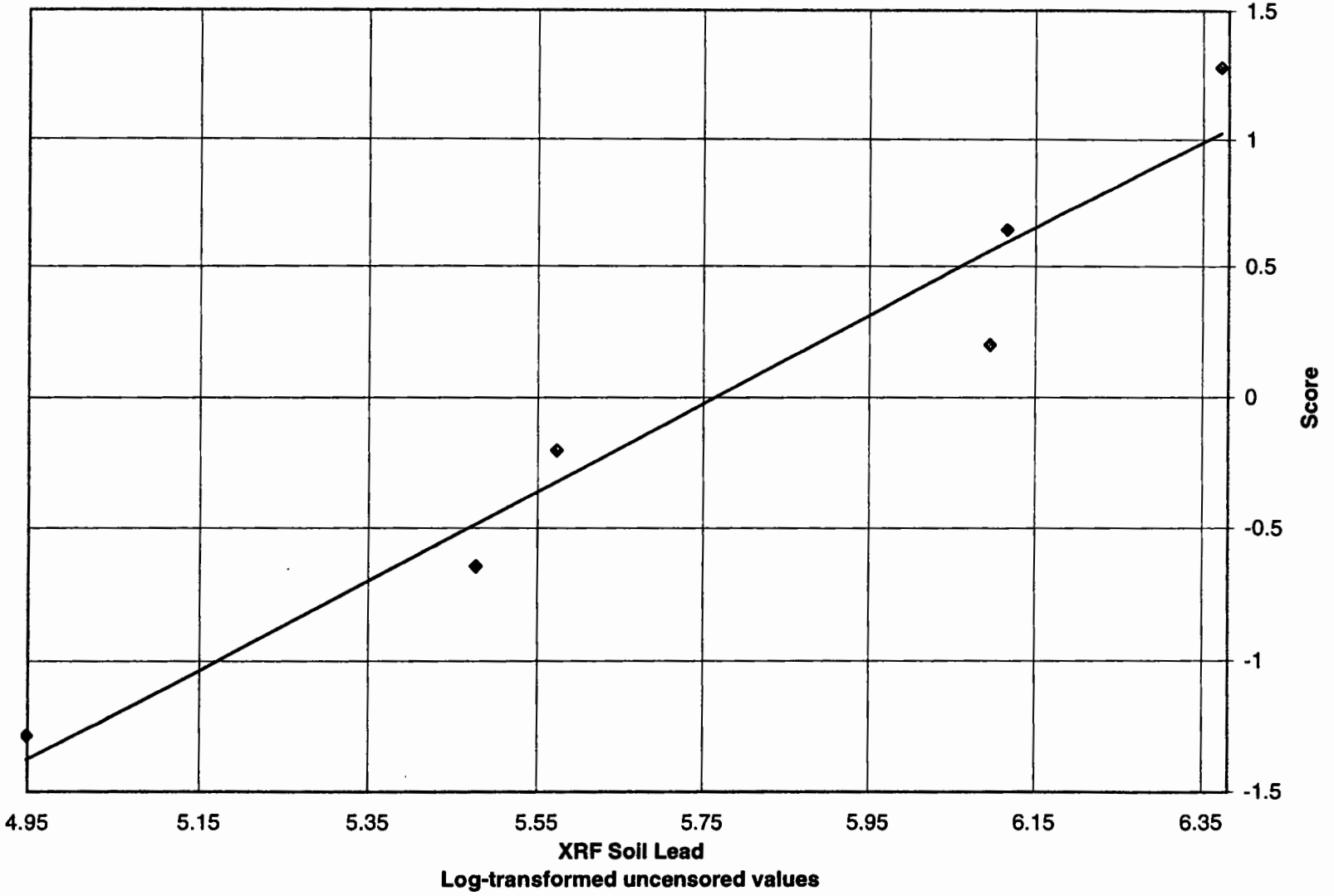
Recommendations:
Assume lognormal distribution.
W value is 0.9373. This exceeds the tabled value of 0.788

UCL (Land's method) is 691.99

Statistics may be unreliable due to small number of samples

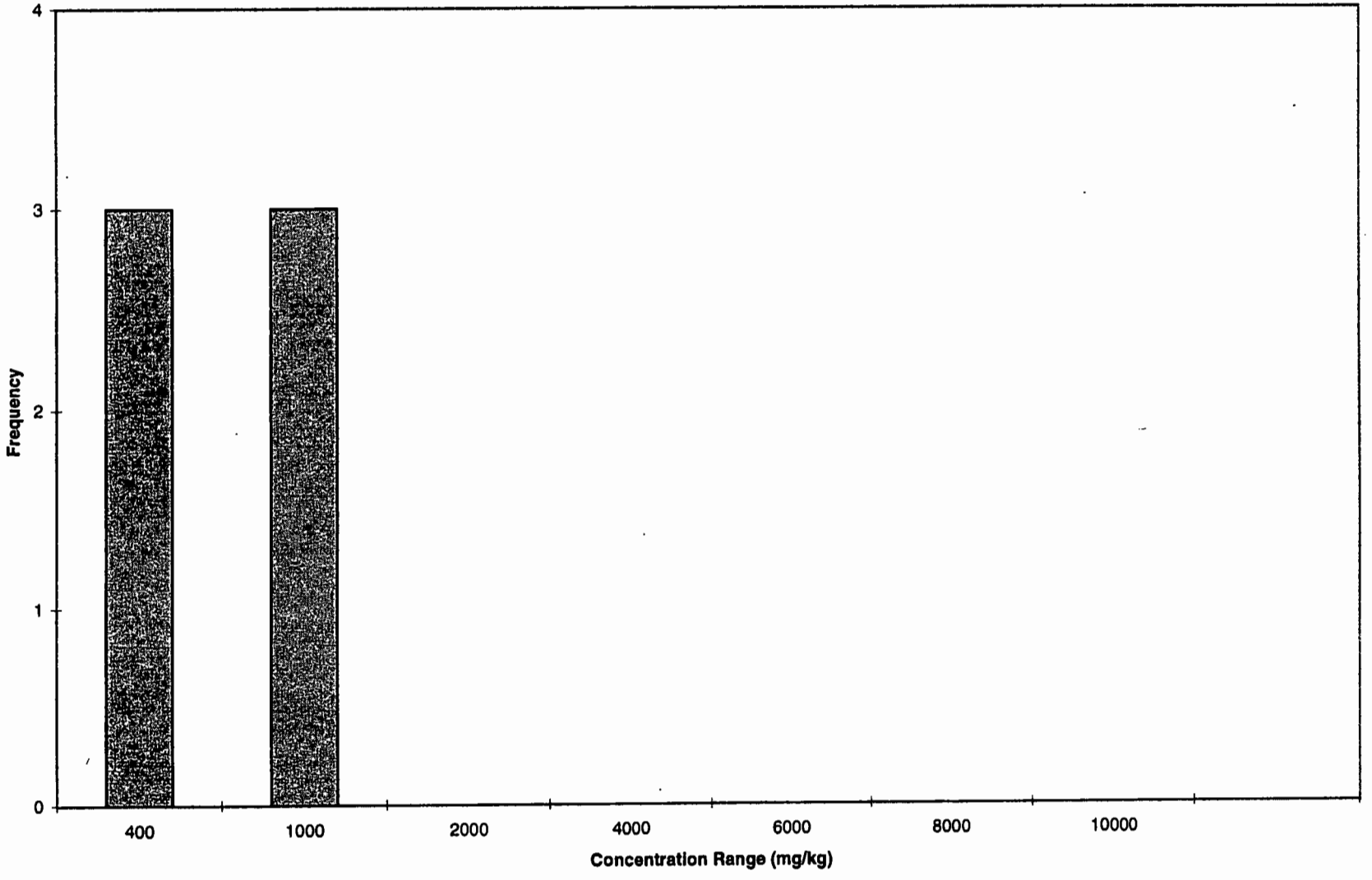
Mare Island Lead Based Paint Survey
Building 653 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



653XRFP.XLS

Mare Island Lead Based Paint Survey
Building 653 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 653 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
485.49
478.15
231.06
330.55
310.97
593.14

Number of samples	6	Uncensored values	
Uncensored	6	Mean	404.89
Censored	0	Lognormal mean	409.79
Detection limit or PQL	150	Std. devn.	135.548186
Method detection limit		Median	404.34925
TOTAL	6	Min.	231.0555
		Max.	593.1375

Lognormal distribution?		Normal distribution?	
r-squared is:	0.952	r-squared is:	0.953

Recommendations:
Assume lognormal distribution.
W value is 0.945. This exceeds the tabled value of 0.788

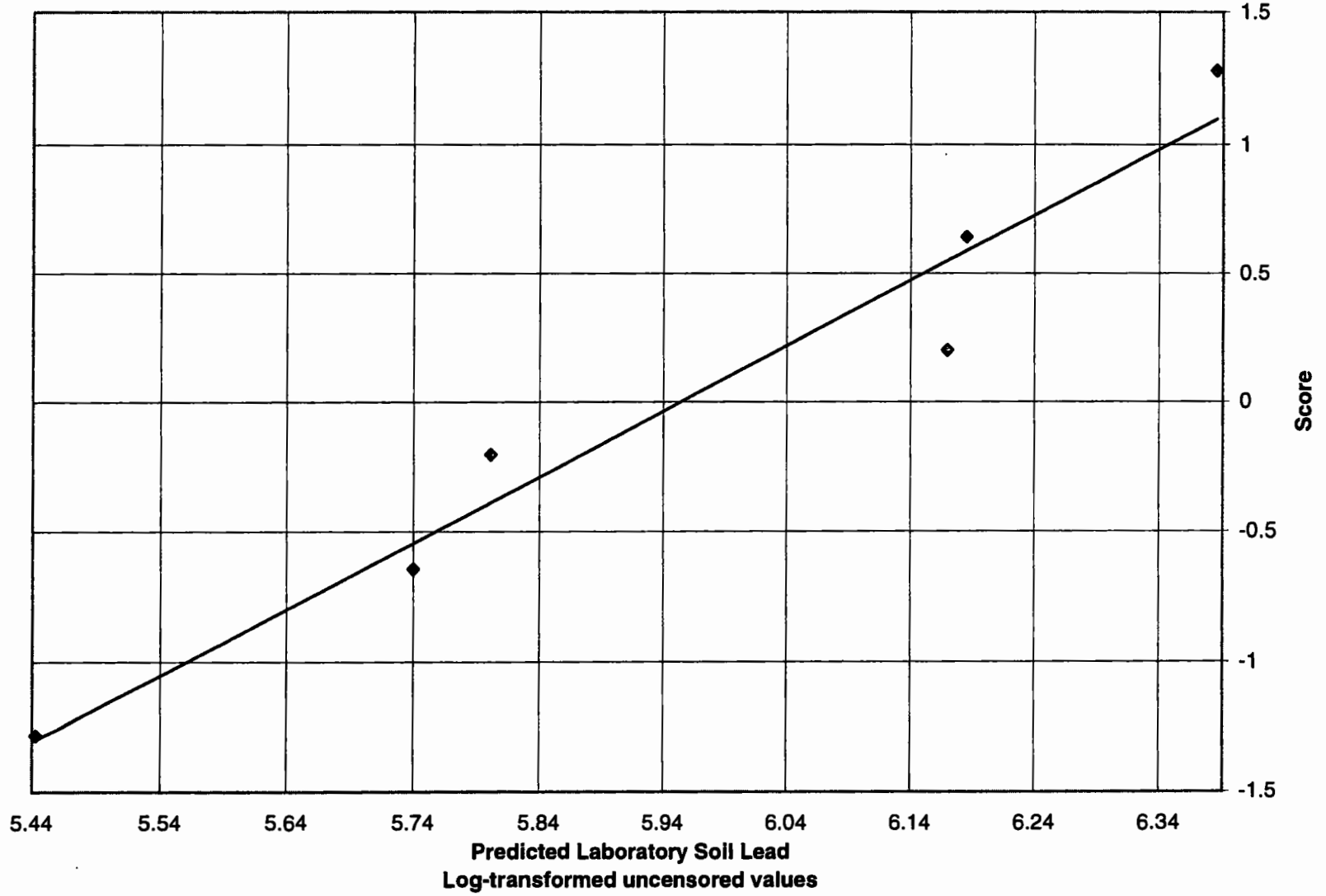
UCL (Land's method) is 590.28

Statistics may be unreliable due to small number of samples

Predicted laboratory concentration calculated from regression equation

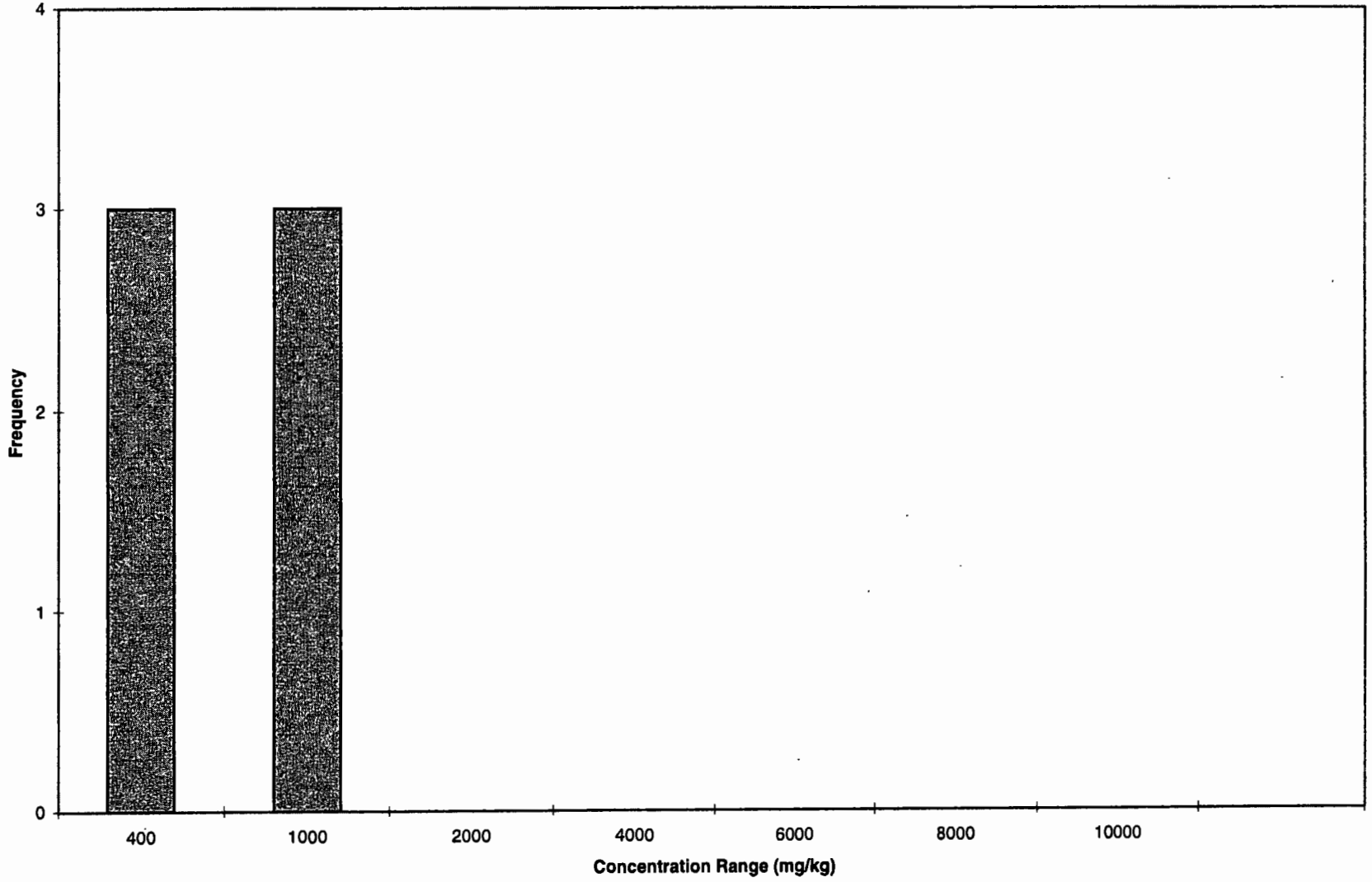
Mare Island Lead Based Paint Survey
Building 653 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



653LABP.XLS

Mare Island Lead Based Paint Survey
Building 653 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 658 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
540
127
262
142
328
403
647
186

Number of samples	8	Uncensored values	
Uncensored	8	Mean	329.38
Censored	0	Lognormal mean	338.91
Detection limit or PQL	50	Std. devn.	189.673356
Method detection limit		Median	295
TOTAL	8	Min.	127
		Max.	647

Lognormal distribution?		Normal distribution?	
r-squared is:	0.972	r-squared is:	0.940

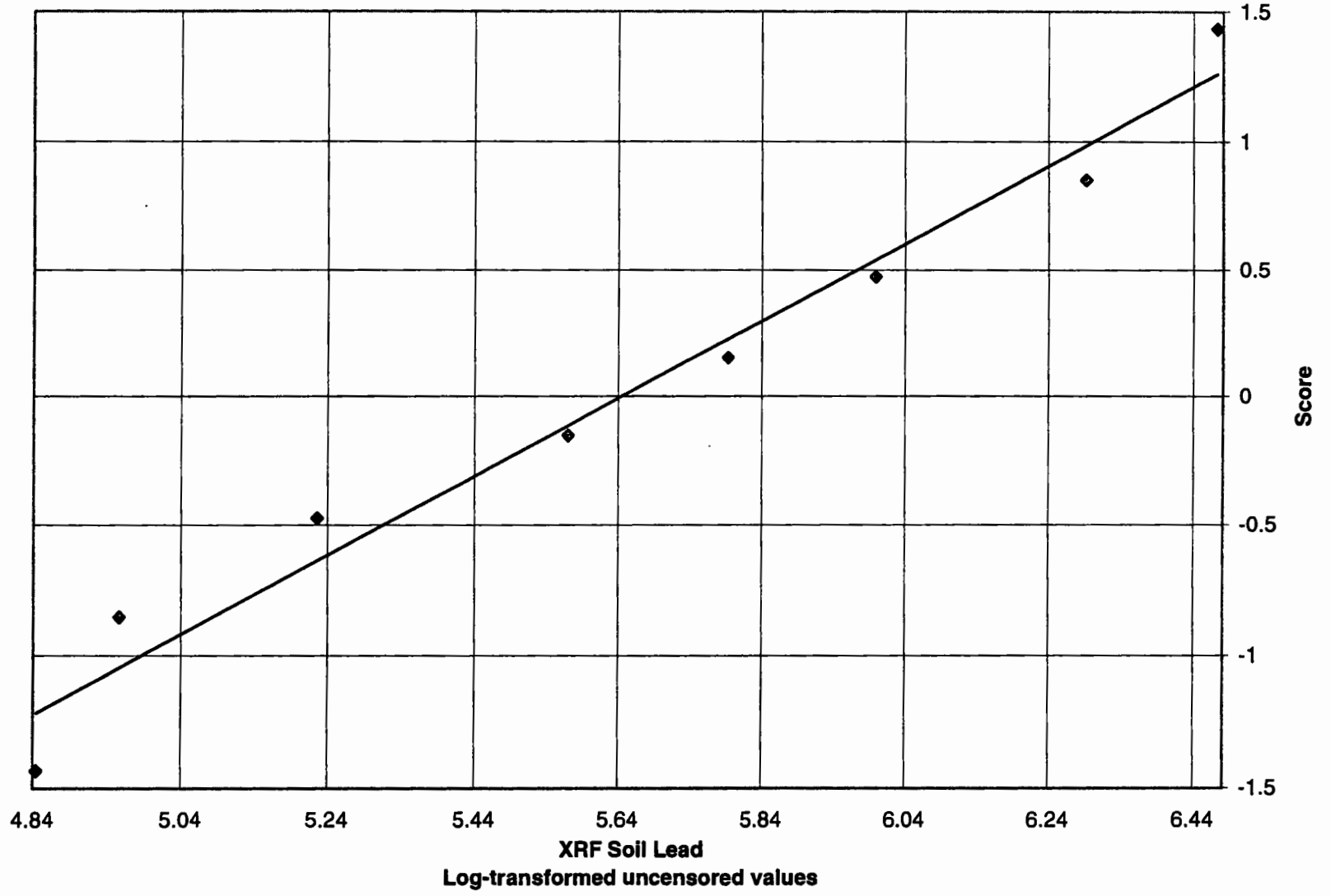
Recommendations:
Assume lognormal distribution.
W value is 0.9495. This exceeds the tabled value of 0.818

UCL (Land's method) is 604.88

Statistics may be unreliable due to small number of samples

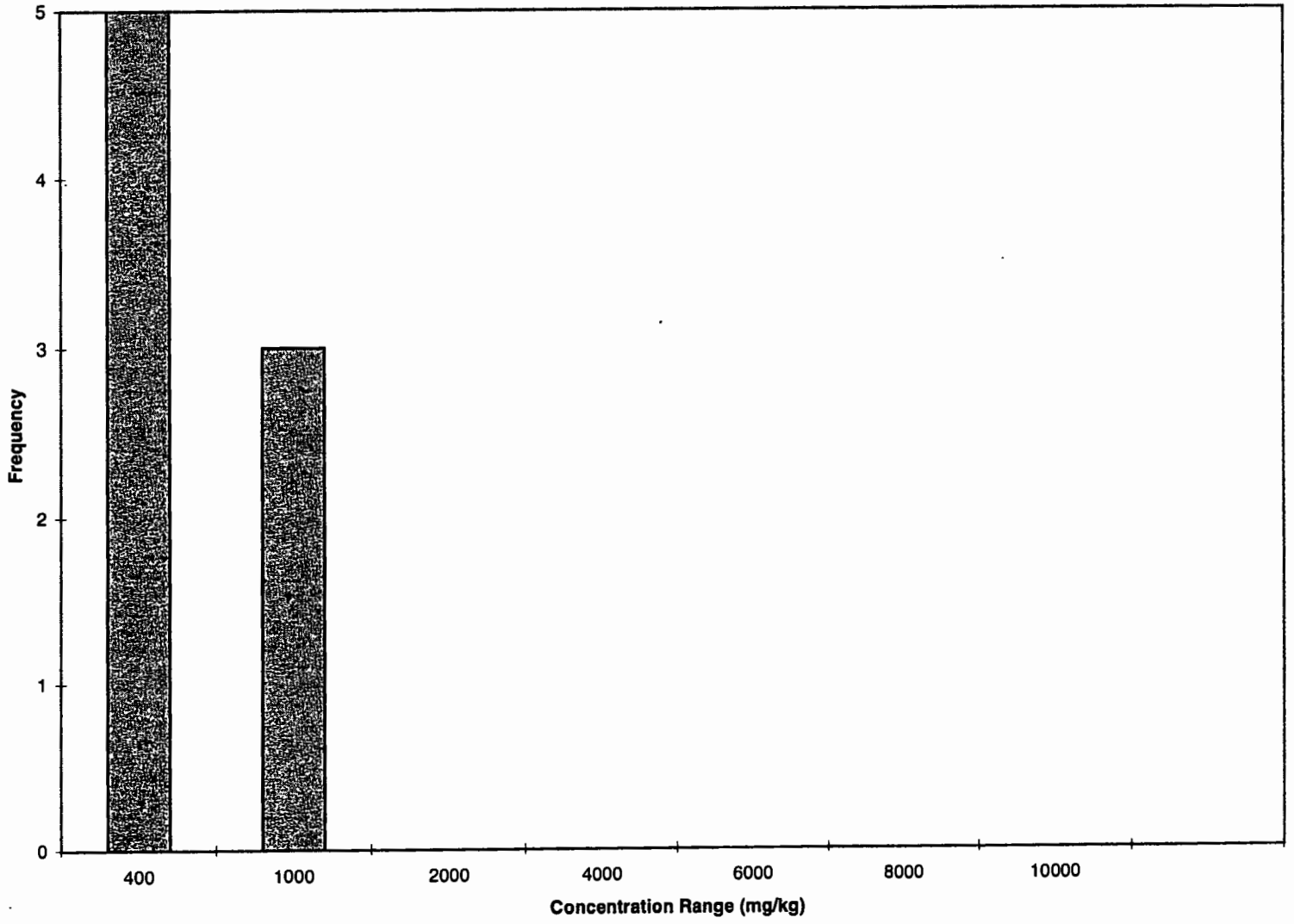
Mare Island Lead Based Paint Survey
Building 658 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



658XRFP.XLS

Mare Island Lead Based Paint Survey
Building 658 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 658 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
556.44
219.64
329.73
231.87
383.55
444.72
643.7
267.75

Number of samples	8	Uncensored values	
Uncensored	8	Mean	384.68
Censored	0	Lognormal mean	388.38
Detection limit or PQL	150	Std. devn.	154.678622
Method detection limit		Median	356.6425
TOTAL	8	Min.	219.6385
		Max.	643.6985

Lognormal distribution?		Normal distribution?	
r-squared is:	0.968	r-squared is:	0.940

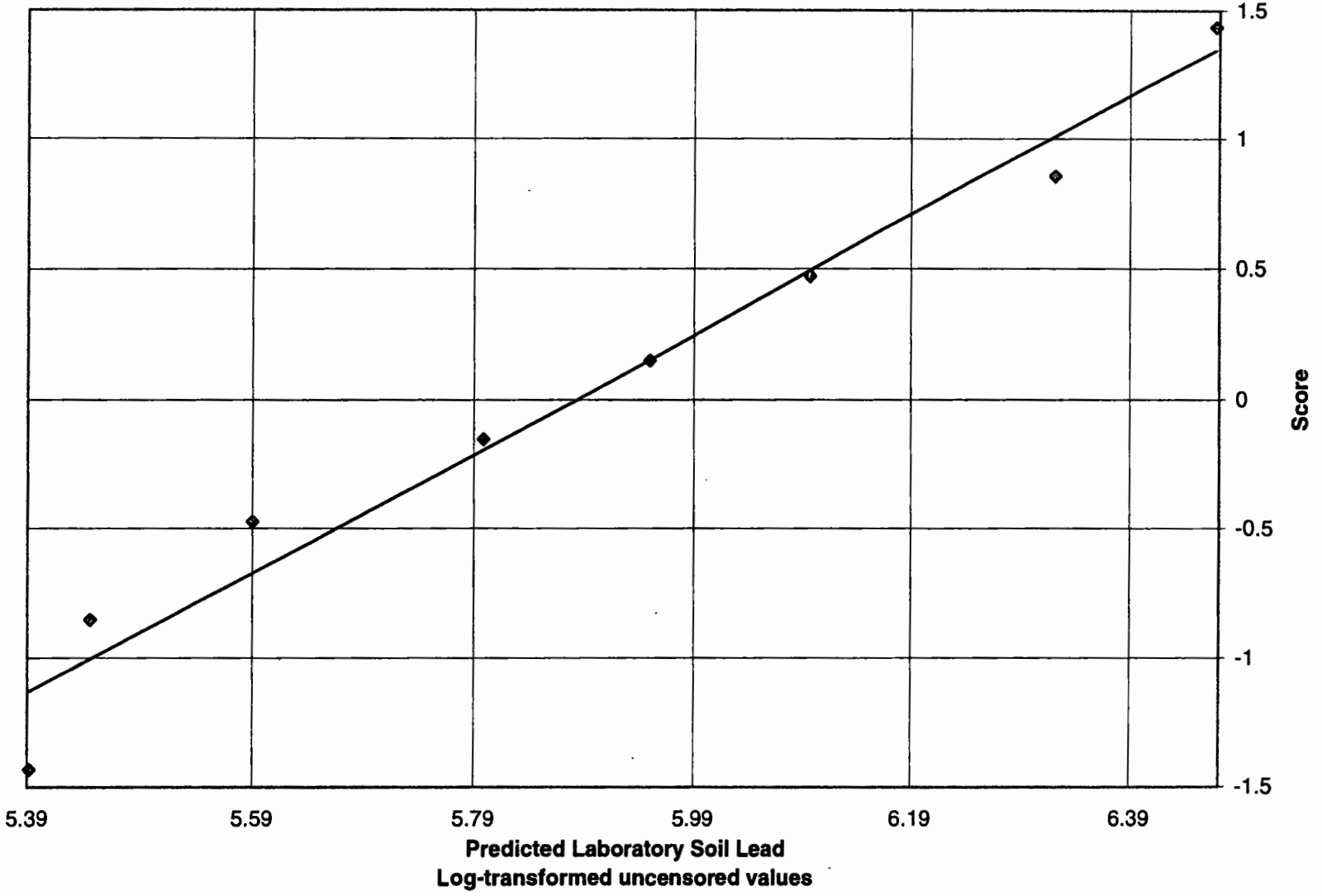
Recommendations:
Assume lognormal distribution.
W value is 0.9467. This exceeds the tabled value of 0.818

UCL (Land's method) is 540.12

Statistics may be unreliable due to small number of samples

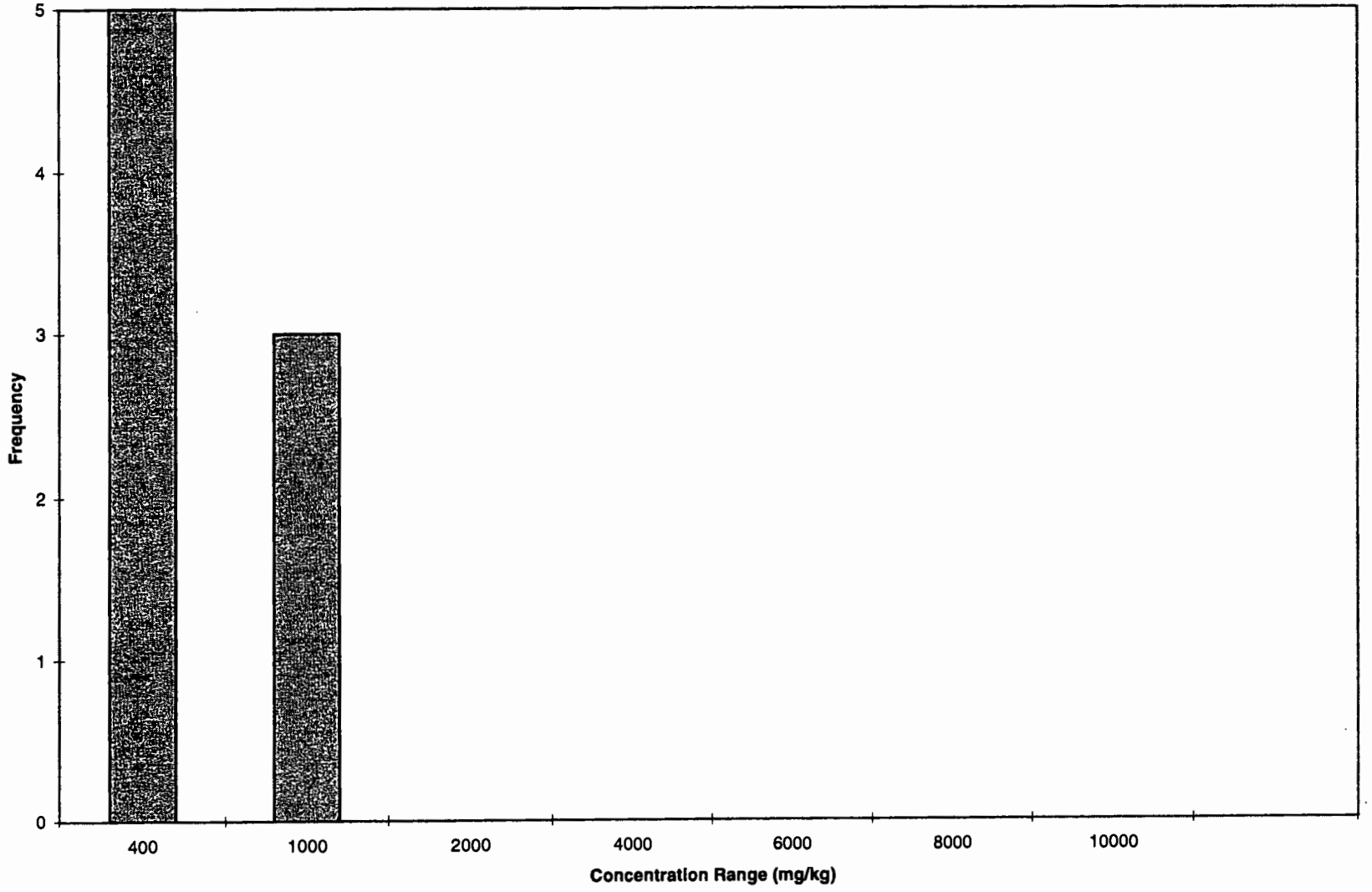
Mare Island Lead Based Paint Survey
Building 658 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



658LABP.XLS

Mare Island Lead Based Paint Survey
Building 658 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 755 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
186
151
316
138
210
407

Number of samples	6	Uncensored values	
Uncensored	6	Mean	234.67
Censored	0	Lognormal mean	237.49
Detection limit or PQL	50	Std. devn.	105.484912
Method detection limit		Median	198
TOTAL	6	Min.	138
		Max.	407

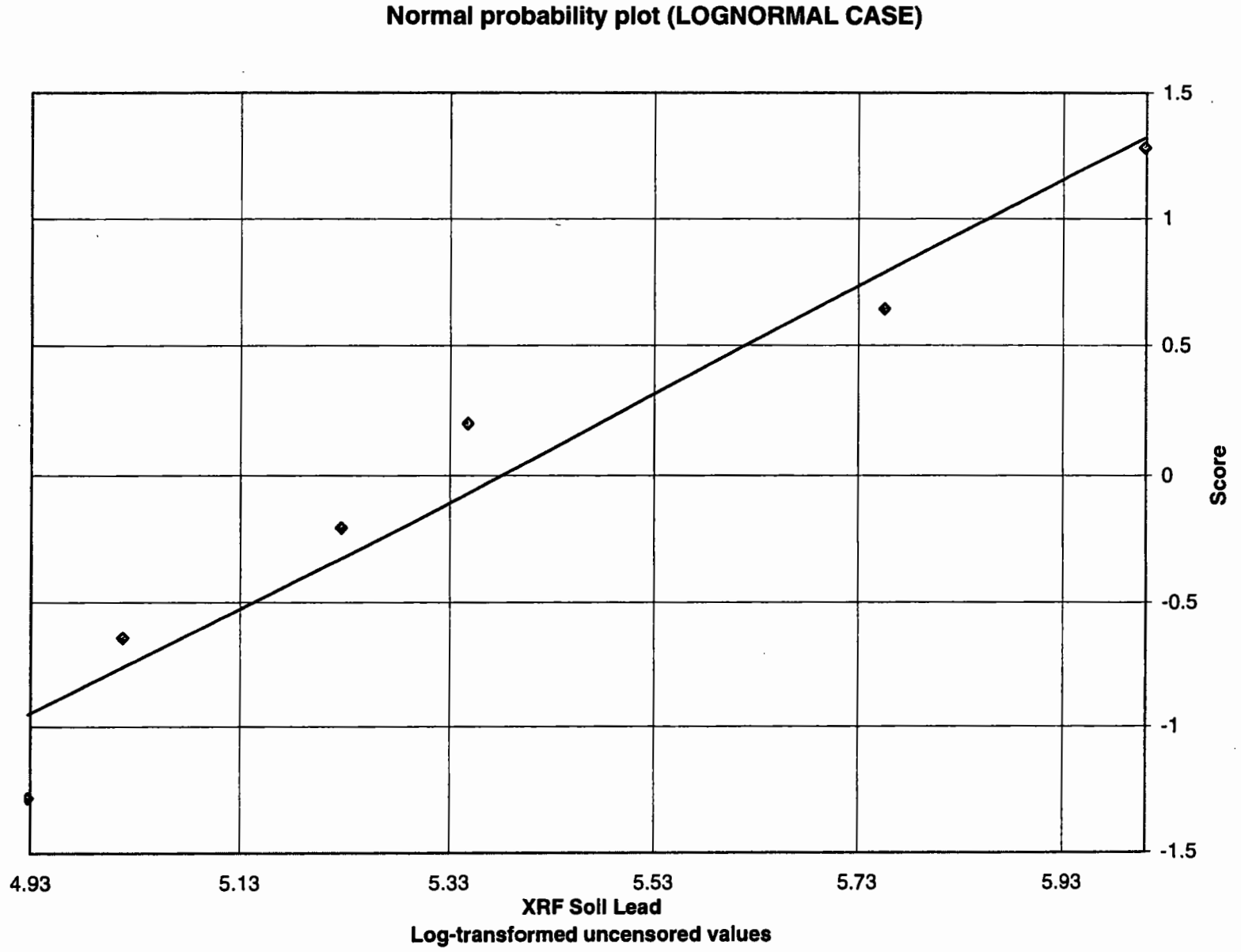
Lognormal distribution?		Normal distribution?	
r-squared is:	0.944	r-squared is:	0.890

Recommendations:
Assume lognormal distribution.
W value is 0.9291. This exceeds the tabled value of 0.788

UCL (Land's method) is 379.13

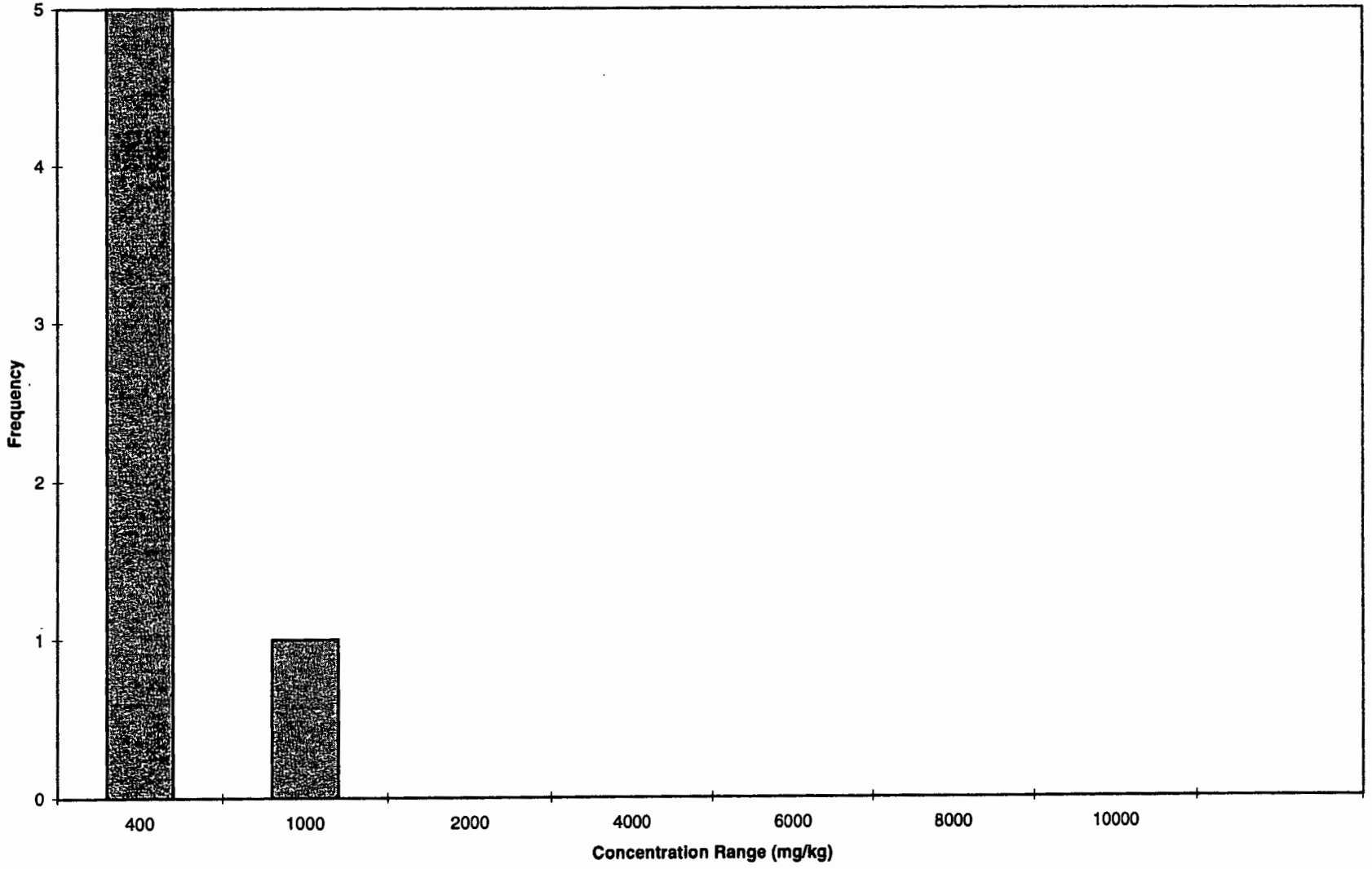
Statistics may be unreliable due to small number of samples

Mare Island Lead Based Paint Survey
Building 755 XRF Soil Lead



755xrfp.xls

Mare Island Lead Based Paint Survey
Building 755 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 755 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
267.75
239.21
373.77
228.61
287.33
447.98

Number of samples	6	Uncensored values	
Uncensored	6	Mean	307.44
Censored	0	Lognormal mean	308.88
Detection limit or PQL	150	Std. devn.	86.0229458
Method detection limit		Median	277.539
TOTAL	6	Min.	228.609
		Max.	447.9785

Lognormal distribution?		Normal distribution?	
r-squared is:	0.925	r-squared is:	0.890

Recommendations:
Assume lognormal distribution.
W value is 0.9119. This exceeds the tabled value of 0.788

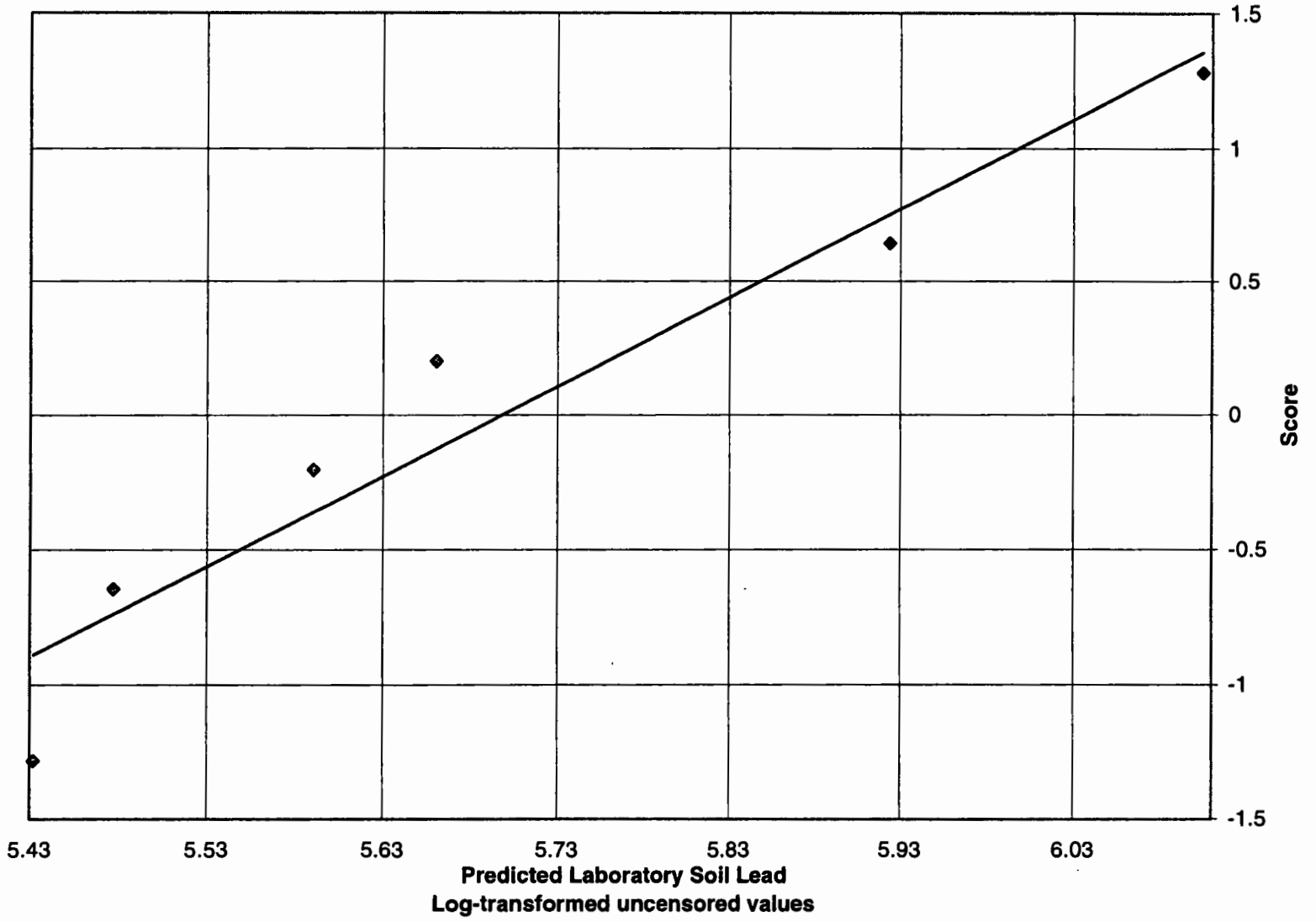
UCL (Land's method) is 399.11

Statistics may be unreliable due to small number of samples

Predicted laboratory concentration calculated from regression equation

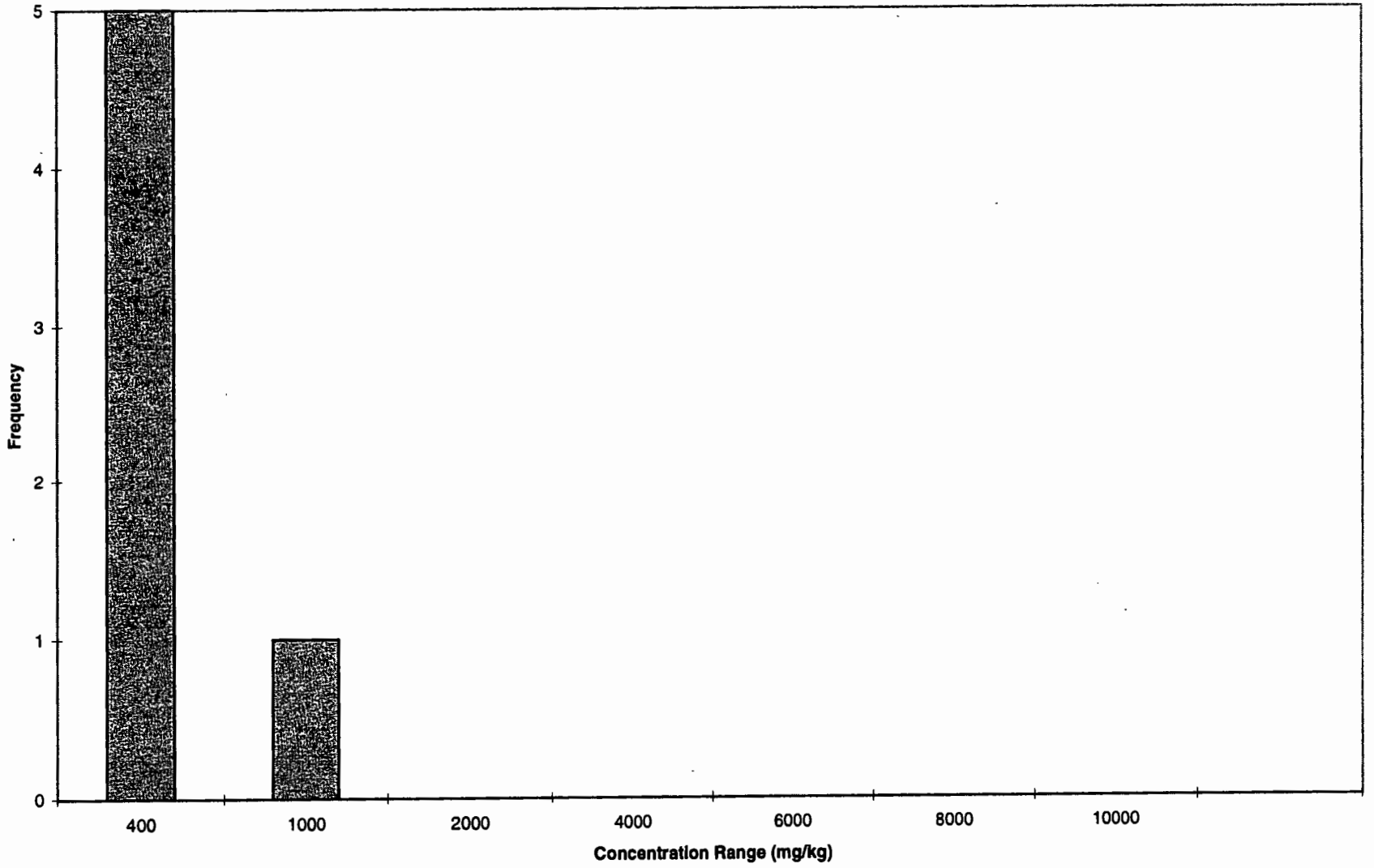
Mare Island Lead Based Paint Survey
Building 755 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



755labp.xls

Mare Island Lead Based Paint Survey
Building 755 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 892 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
5043
735
642
7155
5811
4669
1059
1012
1097
1130
1367
772
2968
1998
1052
4966
2909
3006
875
596

Number of samples	20	Uncensored values	
Uncensored	20	Mean	2443.10
Censored	0	Lognormal mean	2478.79
Detection limit or PQL	50	Std. devn.	2026.78701
Method detection limit		Median	1248.5
TOTAL	20	Min.	596
		Max.	7155

Lognormal distribution?		Normal distribution?	
r-squared is:	0.921	r-squared is:	0.832

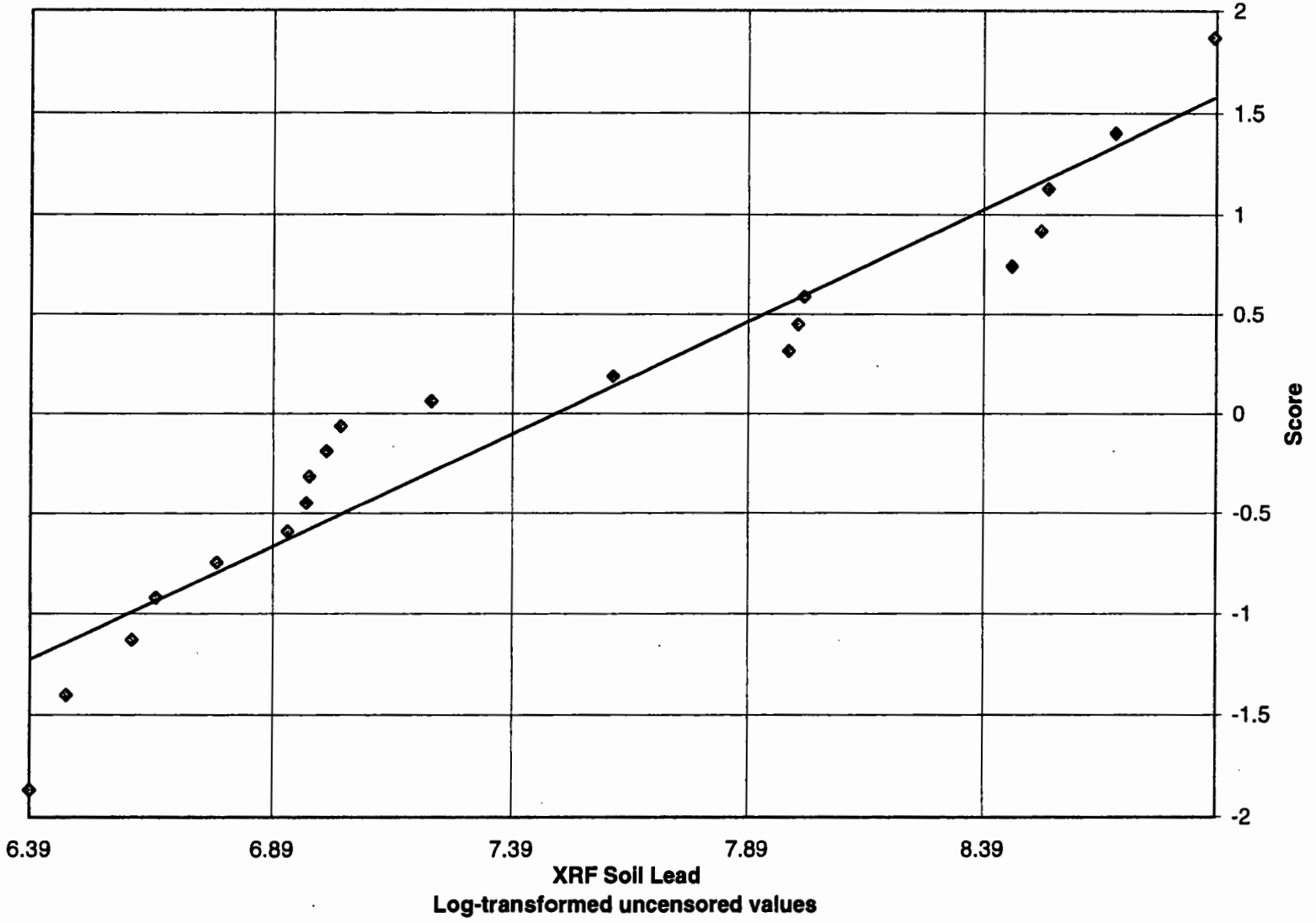
Recommendations:
Reject lognormal distribution.
W value is 0.903. This is less than the tabled value of 0.905
Reject normal distribution.
W value is 0.8235. This is less than the tabled value of 0.905

UCL (Land's method) is 3865.77

UCL (based on Z-statistic) is 3188.62

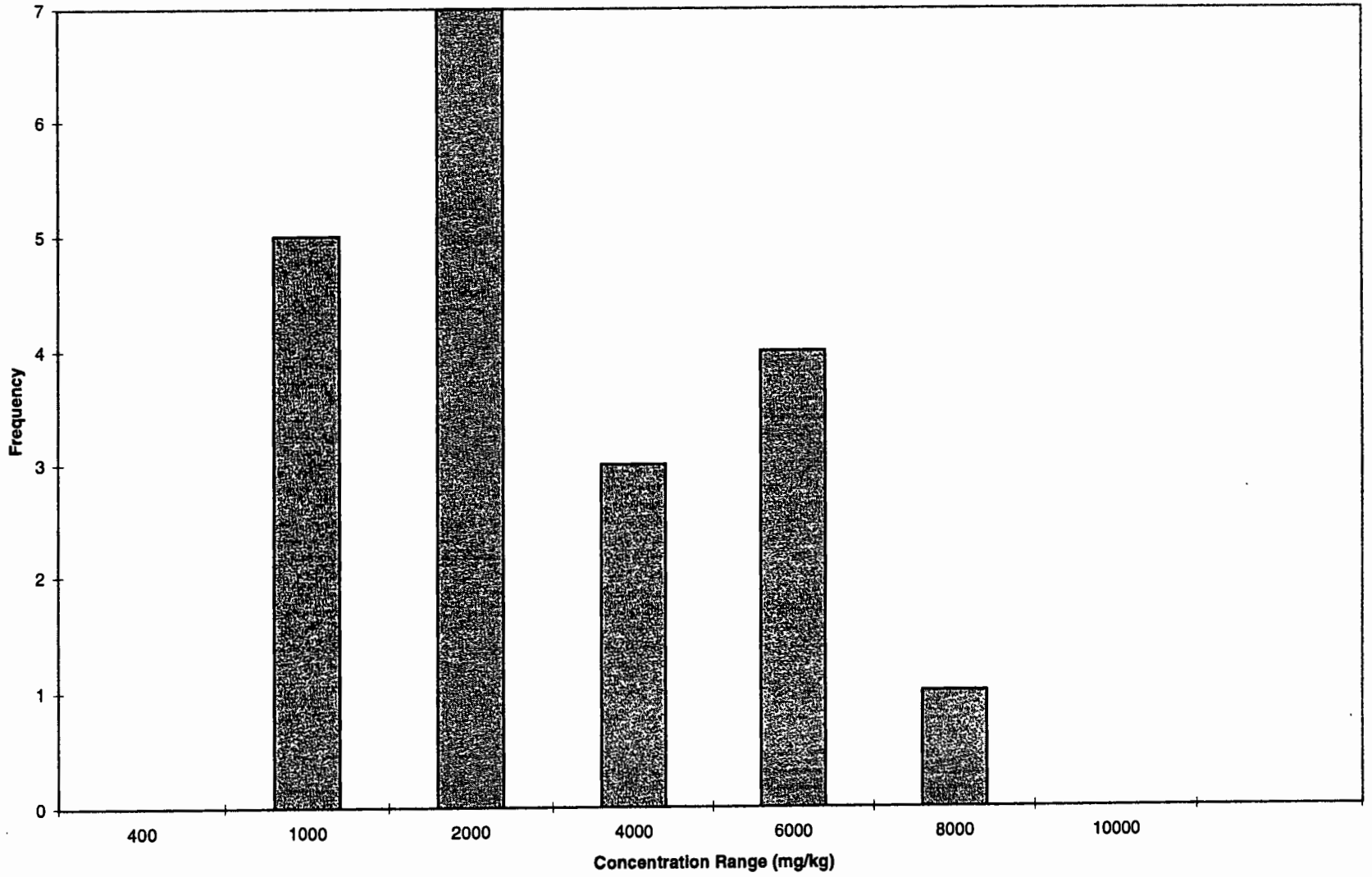
Mare Island Lead Based Paint Survey
Building 892 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



892xrfp.xls

Mare Island Lead Based Paint Survey
Building 892 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 892 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
4228.6
715.46
639.62
5951
4854.9
3923.6
979.68
941.36
1010.7
1037.6
1230.9
745.64
2536.5
1745.4
973.98
4165.8
2488.4
2567.5
829.63
602.11

Number of samples	20	Uncensored values	
Uncensored	20	Mean	2108.42
Censored	0	Lognormal mean	2126.09
Detection limit or PQL	150	Std. devn.	1652.8448
Method detection limit		Median	1134.22175
TOTAL	20	Min.	602.108
		Max.	5950.9725

Lognormal distribution?		Normal distribution?	
r-squared is:	0.915	r-squared is:	0.832

Recommendations:
Reject lognormal distribution.
W value is 0.8968. This is less than the tabled value of 0.905
Reject normal distribution.
W value is 0.8235. This is less than the tabled value of 0.905

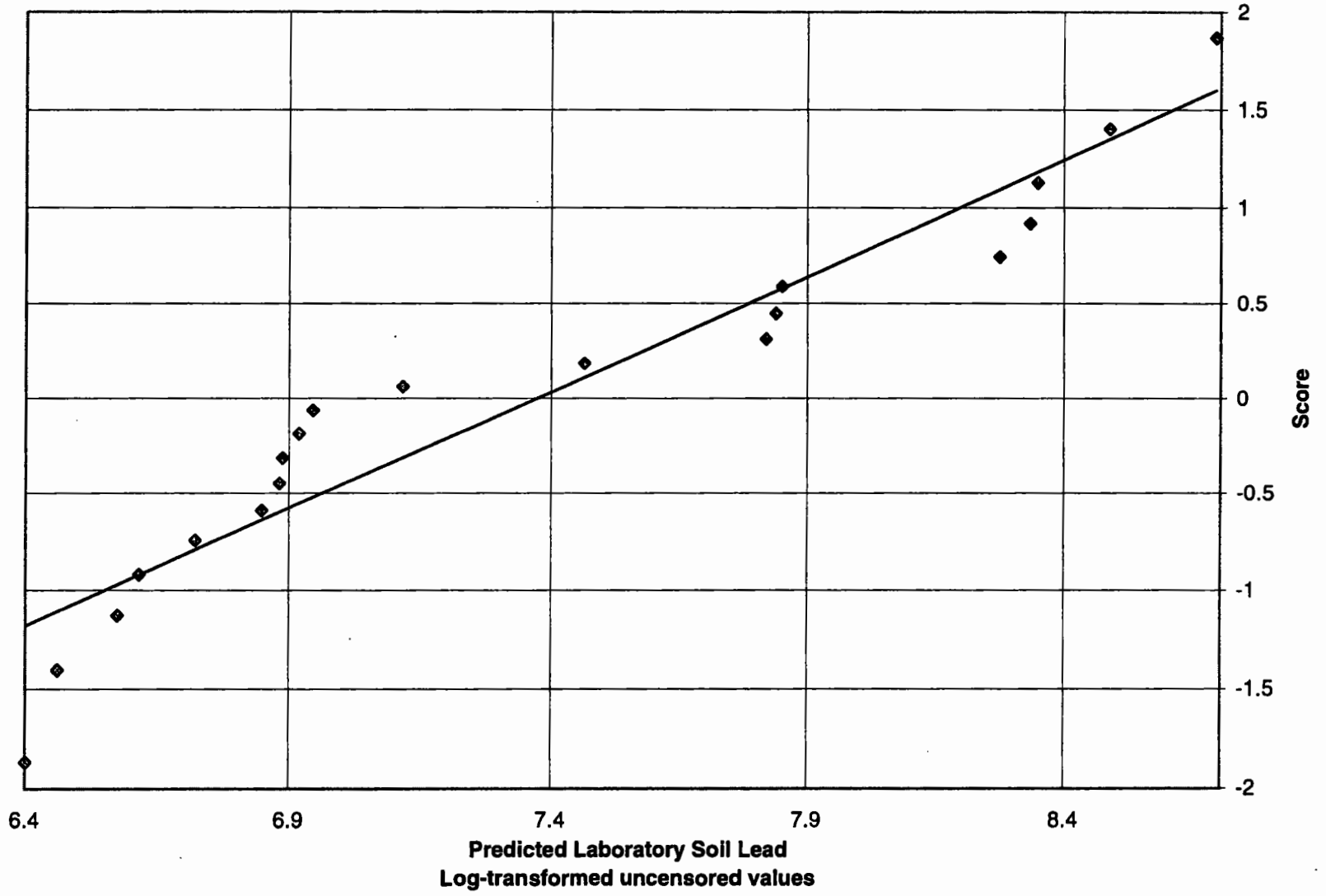
UCL (Land's method) is 3165.9

UCL (based on Z-statistic) is 2716.389

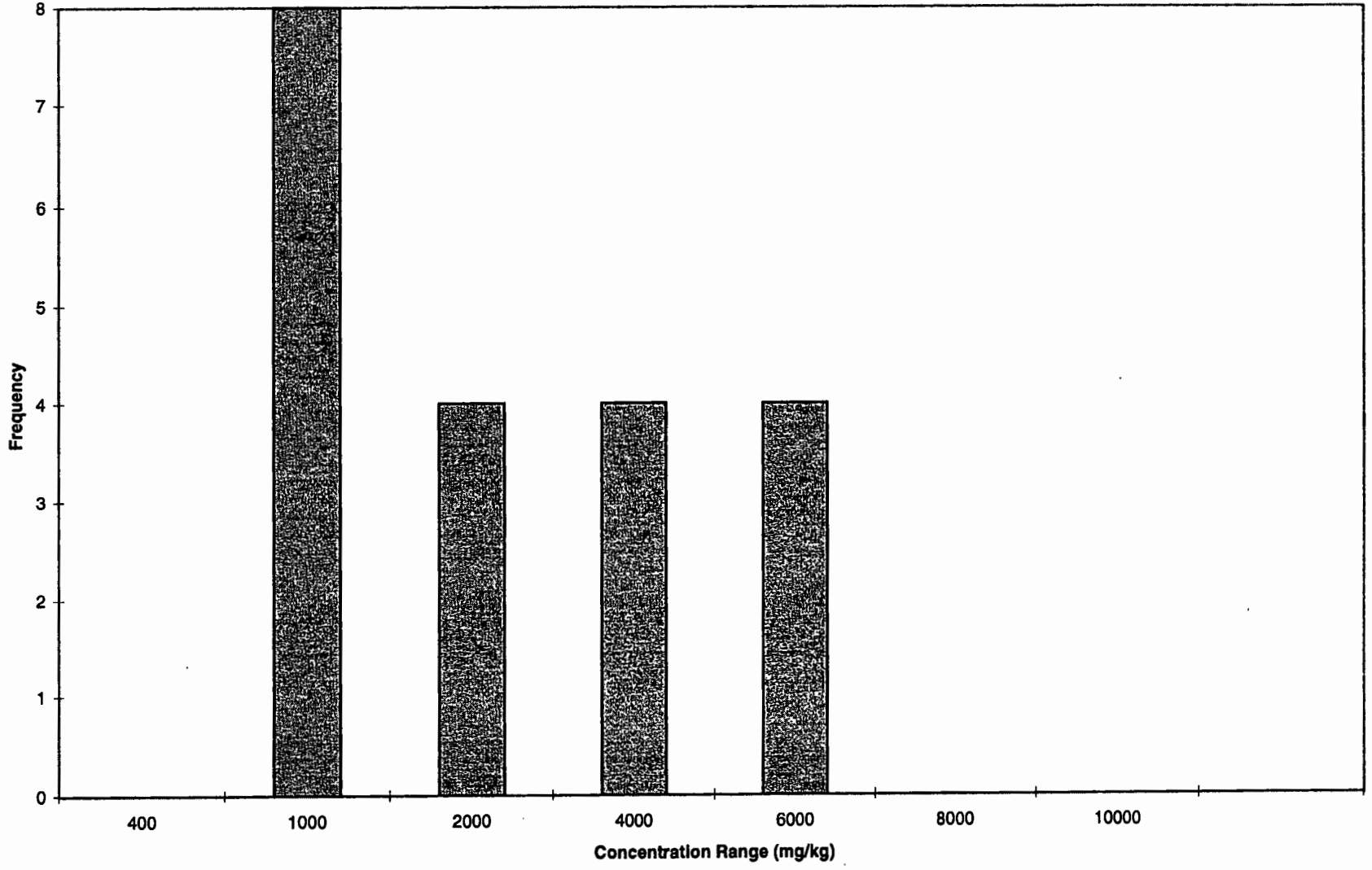
Predicted laboratory concentration calculated from regression equation

Mare Island Lead Based Paint Survey
Building 892 Predicted Laboratory Soil Lead Summary Statistics

Normal probability plot (LOGNORMAL CASE)



Mare Island Lead Based Paint Survey
Building 892 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 926 XRF Soil Lead Summary Statistics

Conc. (mg/kg)		
68	J	
70	J	
114	J	
128		
133		
133		
172		
182		
191		
198		
198		
258		
275		
328		
383		
391		
416		
724		
747		
1113		
1225		
1555		
1744		
1882		
1938		
1970		
2034		
2190		
2566		
3578		
3910		
4733		
<50		
<50		
<50		
<50		
<50		
<50		
<50		
<50		

Number of samples	40	Uncensored values	
Uncensored	32	Mean	1110.84
Censored	8	Lognormal mean	1250.98
Detection limit or PQL	50	Std. devn.	1243.77169
Method detection limit		Median	403.5
TOTAL	40	Min.	68
		Max.	4733

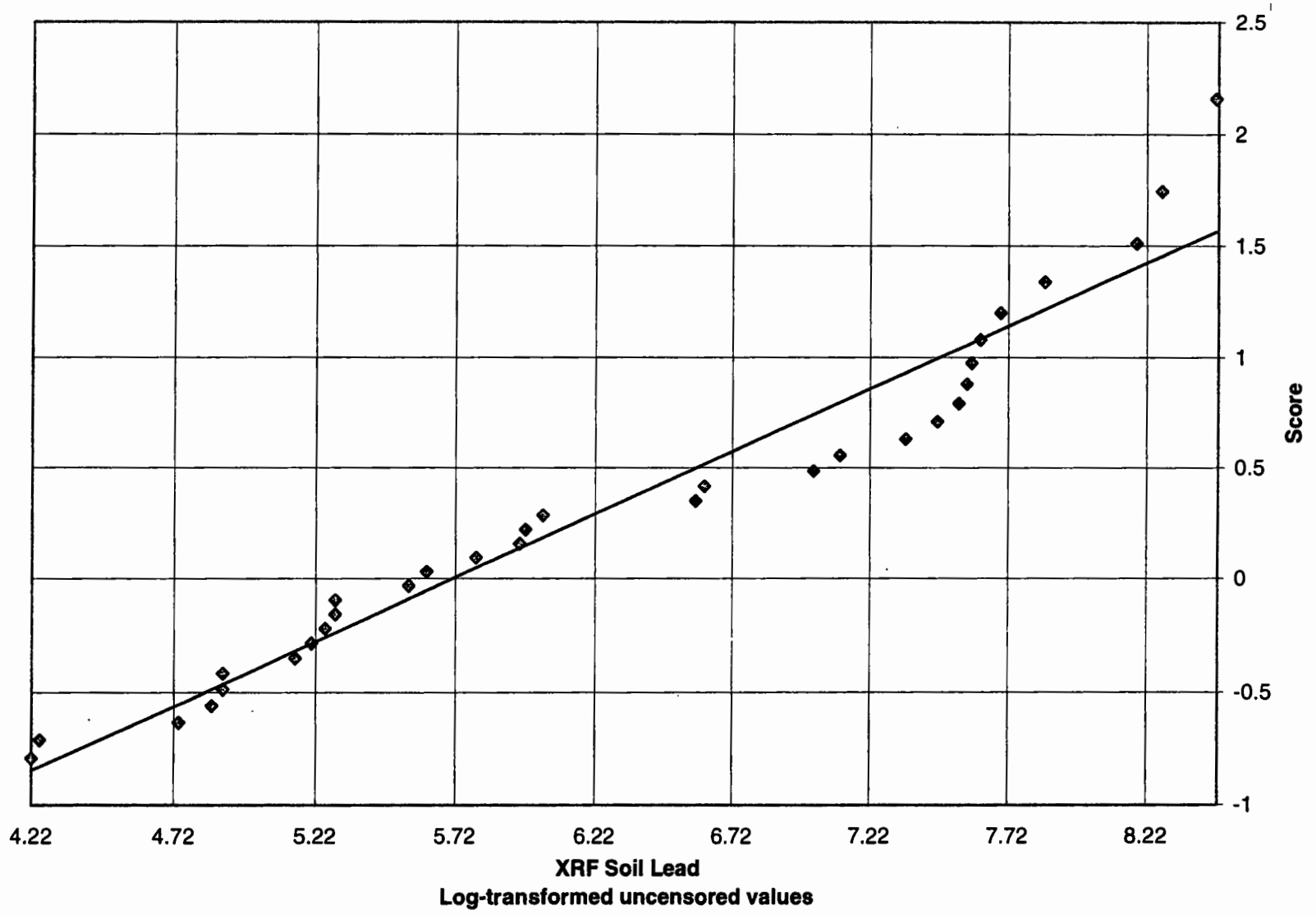
Lognormal distribution?		Normal distribution?	
r-squared is:	0.944	r-squared is:	0.900

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 3821.27
Cohen's method applied.

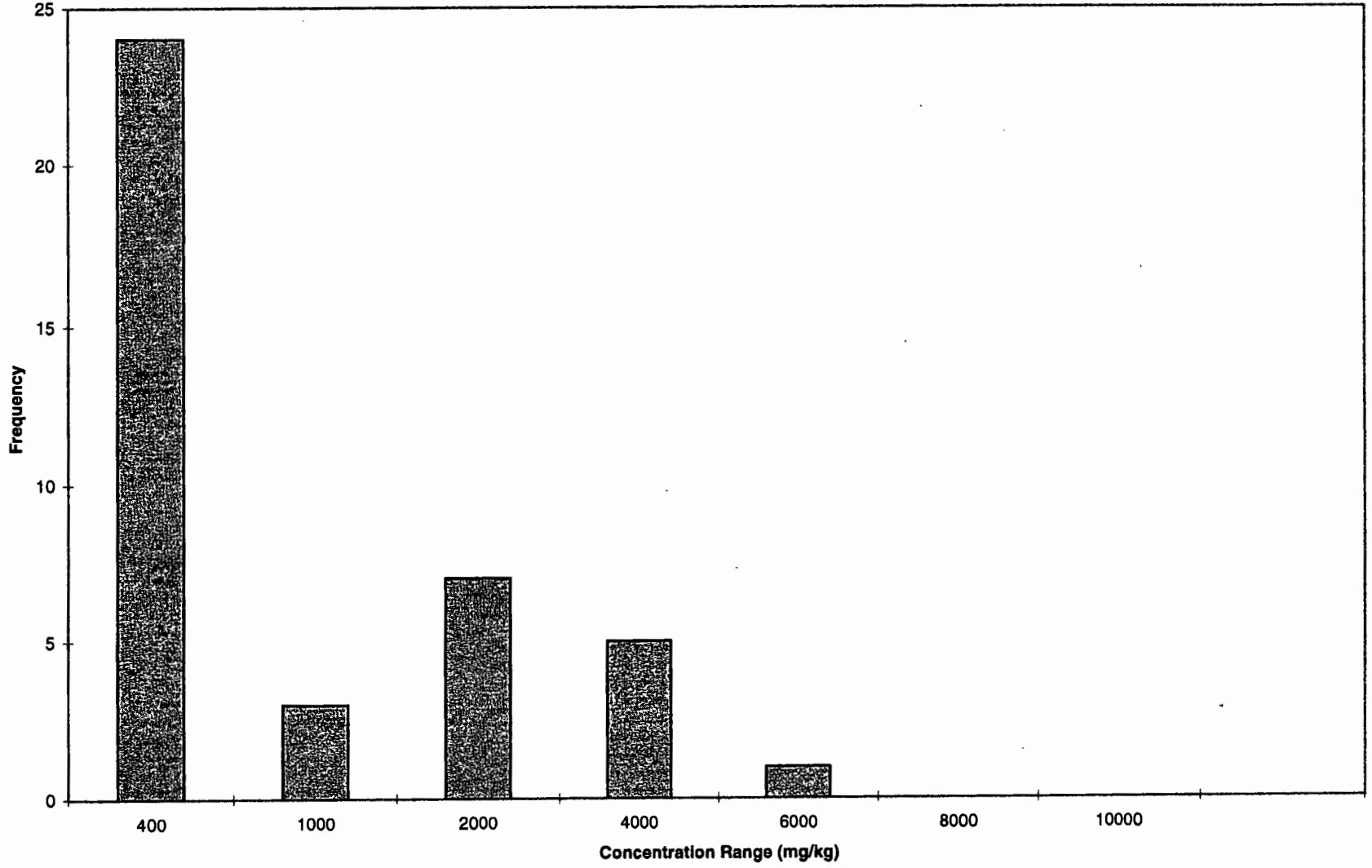
Mare Island Lead Based Paint Survey
Building 926 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



926xrfp.xls

Mare Island Lead Based Paint Survey
Building 926 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint
Building 926 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
171.52
173.16
209.04
220.45
224.53
224.53
256.34
264.49
271.83
277.54
277.54
326.47
340.33
383.55
428.41
434.93
455.32
706.49
725.25
1023.7
1115.1
1384.2
1538.3
1650.8
1696.5
1722.6
1774.8
1902
2208.6
3033.9
3304.7
3975.8
<150
<150
<150
<150
<150
<150
<150
<150

Number of samples	40	Uncensored values	
Uncensored	32	Mean	1021.96
Censored	8	Lognormal mean	1043.13
Detection limit or PQL	150	Std. devn.	1014.29581
Method detection limit		Median	445.12425
TOTAL	40	Min.	171.524
		Max.	3975.8315

Lognormal distribution?		Normal distribution?	
r-squared is:	0.950	r-squared is:	0.900

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1597
Cohen's method applied.

Predicted laboratory concentration calculated from regression equation

Mare Island Lead Based Paint Survey
Building 926 XRF Soil Lead

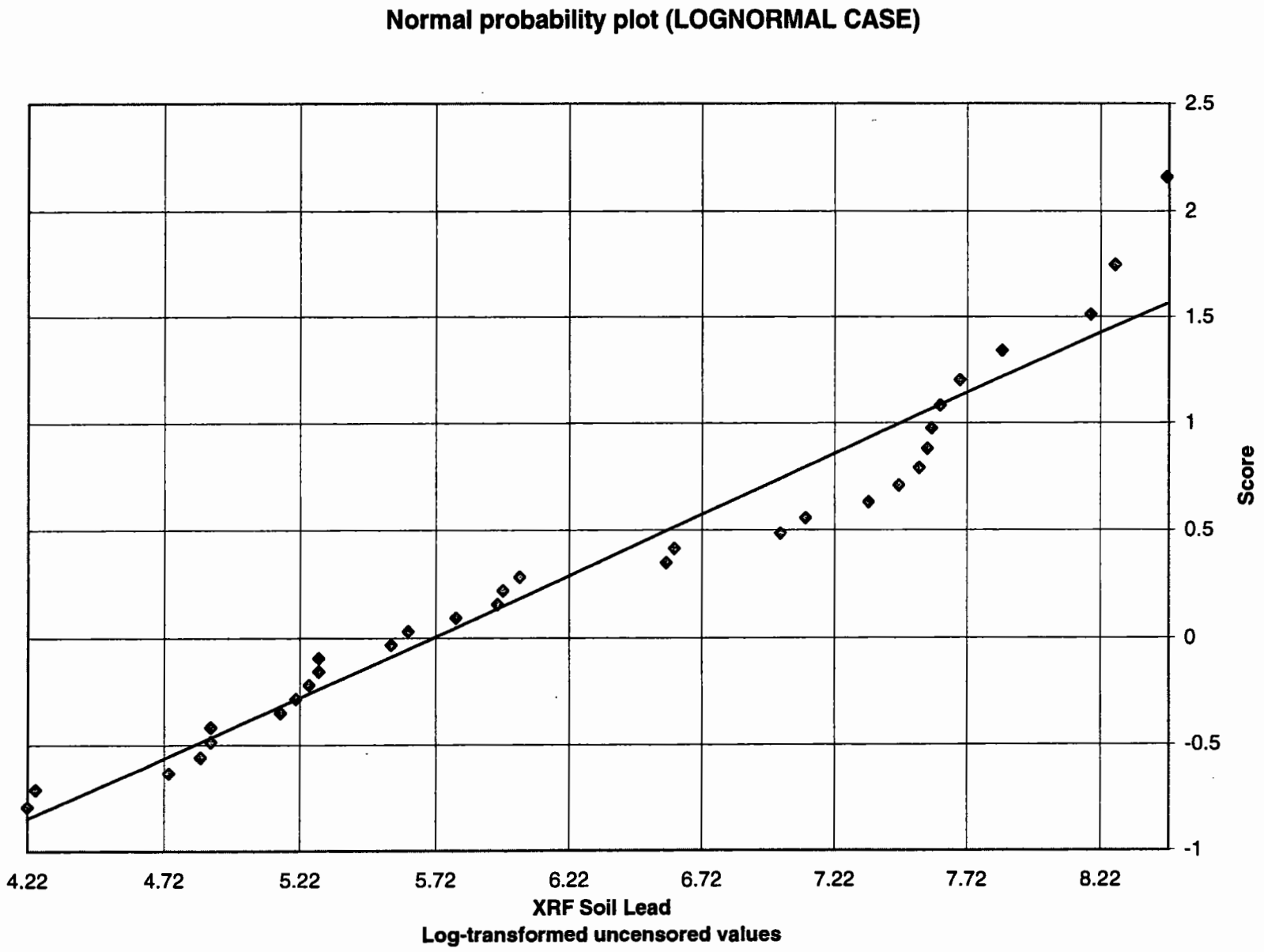
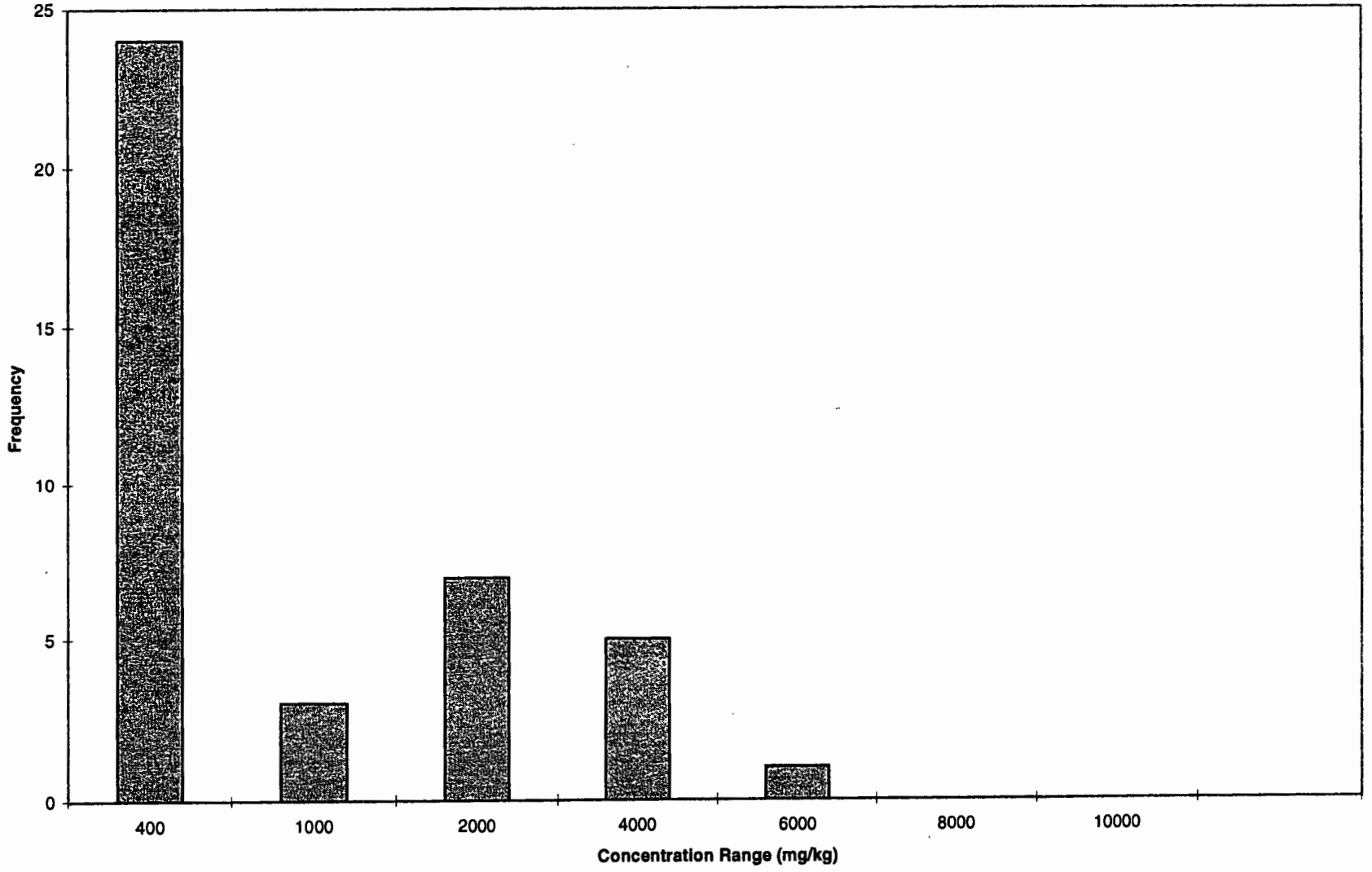


Chart2

Mare Island Lead Based Paint Survey
Building 926 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint
Building 926 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
171.52
173.16
209.04
220.45
224.53
224.53
256.34
264.49
271.83
277.54
277.54
326.47
340.33
383.55
428.41
434.93
455.32
706.49
725.25
1023.7
1115.1
1384.2
1538.3
1650.8
1696.5
1722.6
1774.8
1902
2208.6
3033.9
3304.7
3975.8
<150
<150
<150
<150
<150
<150
<150
<150

Number of samples	40	Uncensored values	
Uncensored	32	Mean	1021.96
Censored	8	Lognormal mean	1043.13
Detection limit or PQL	150	Std. devn.	1014.29581
Method detection limit		Median	445.12425
TOTAL	40	Min.	171.524
		Max.	3975.8315

Lognormal distribution?		Normal distribution?	
r-squared is:	0.950	r-squared is:	0.900

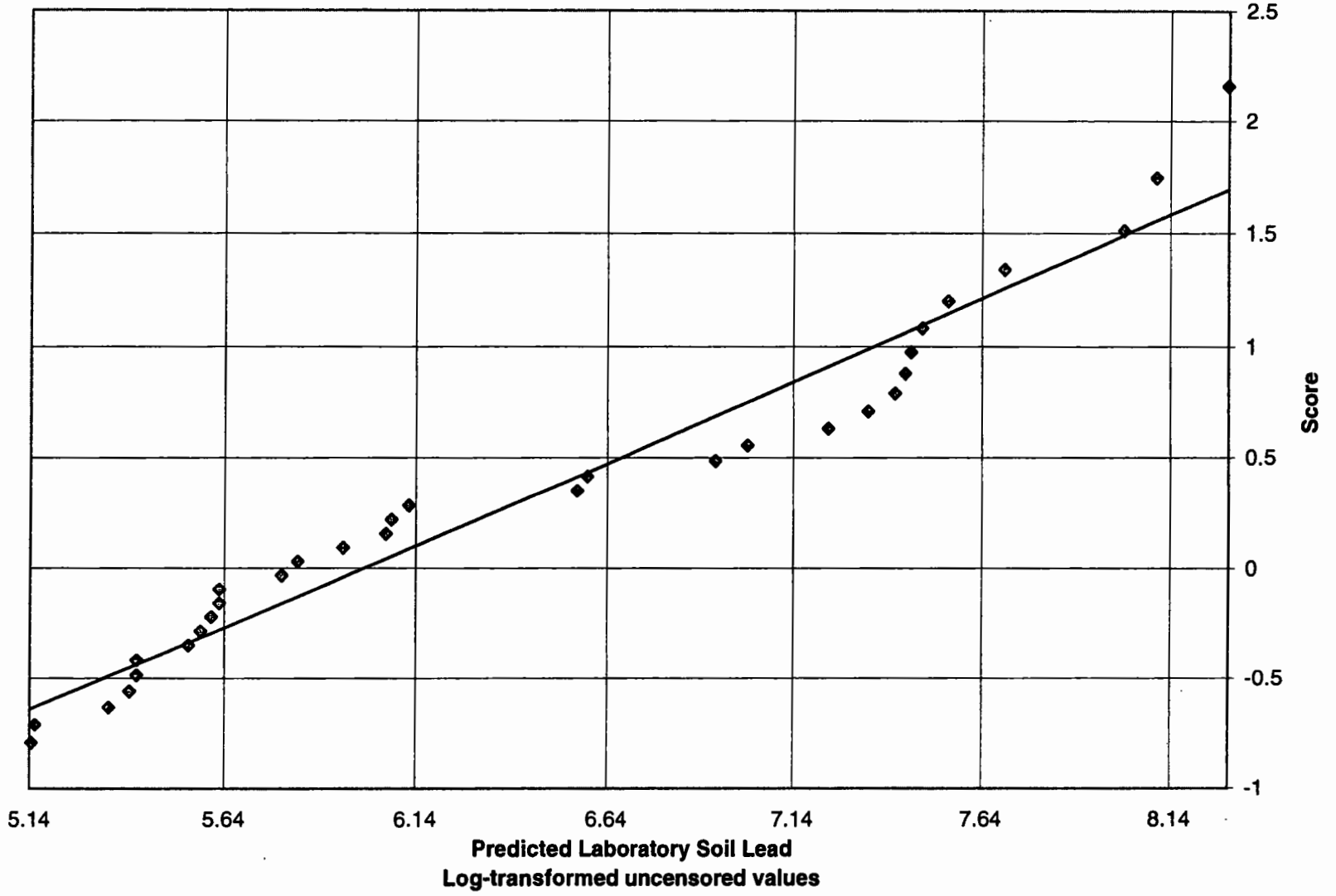
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1597
Cohen's method applied.

Predicted laboratory concentration calculated from regression equation

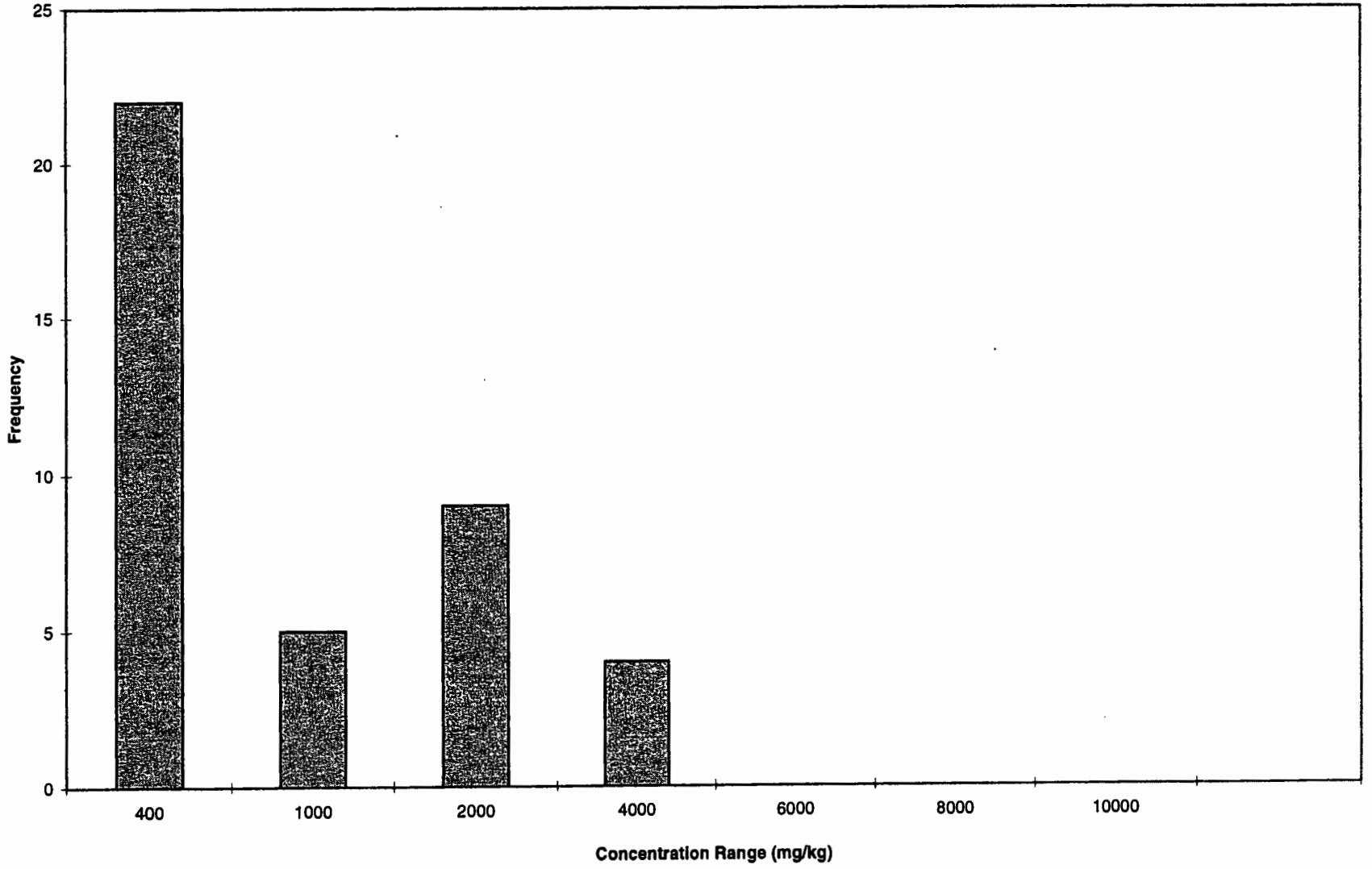
Mare Island Lead Based Paint Survey
Building 926 Predicted Laboratory Lead Summary Statistics

Normal probability plot (LOGNORMAL CASE)



926LABP.XLS

Mare Island Lead Based Paint Survey
Building 926 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 928 XRF Soil Lead Summary Statistics

Conc. (mg/kg)
235
422
323
131
99
91
2237
878

Number of samples	8	Uncensored values	
Uncensored	8	Mean	552.00
Censored	0	Lognormal mean	567.50
Detection limit or PQL	50	Std. devn.	728.040619
Method detection limit		Median	279
TOTAL	8	Min.	91
		Max.	2237

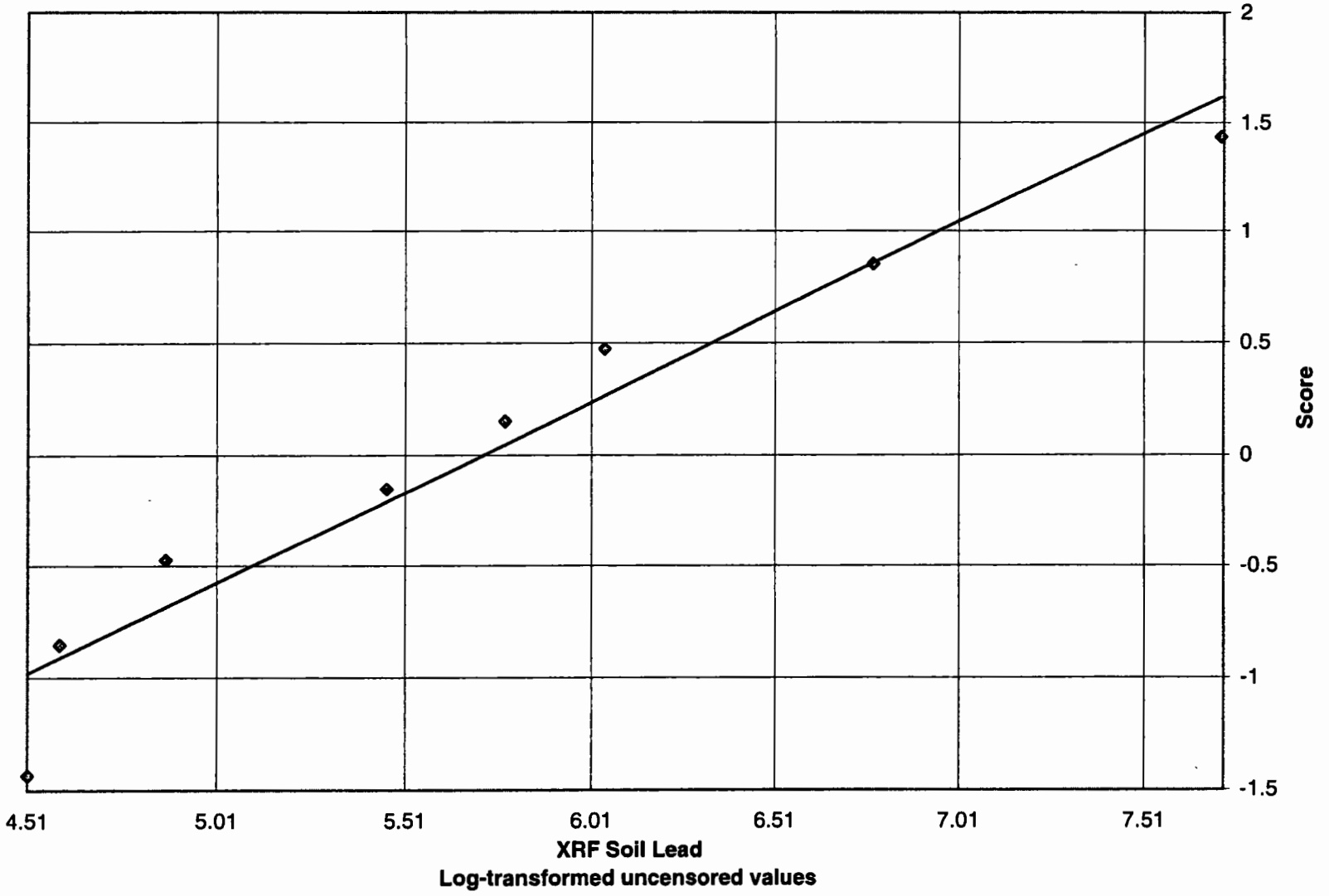
Lognormal distribution?		Normal distribution?	
r-squared is:	0.943	r-squared is:	0.674

Recommendations:
Assume lognormal distribution.
W value is 0.9329. This exceeds the tabled value of 0.818

UCL (Land's method) is 2725.48

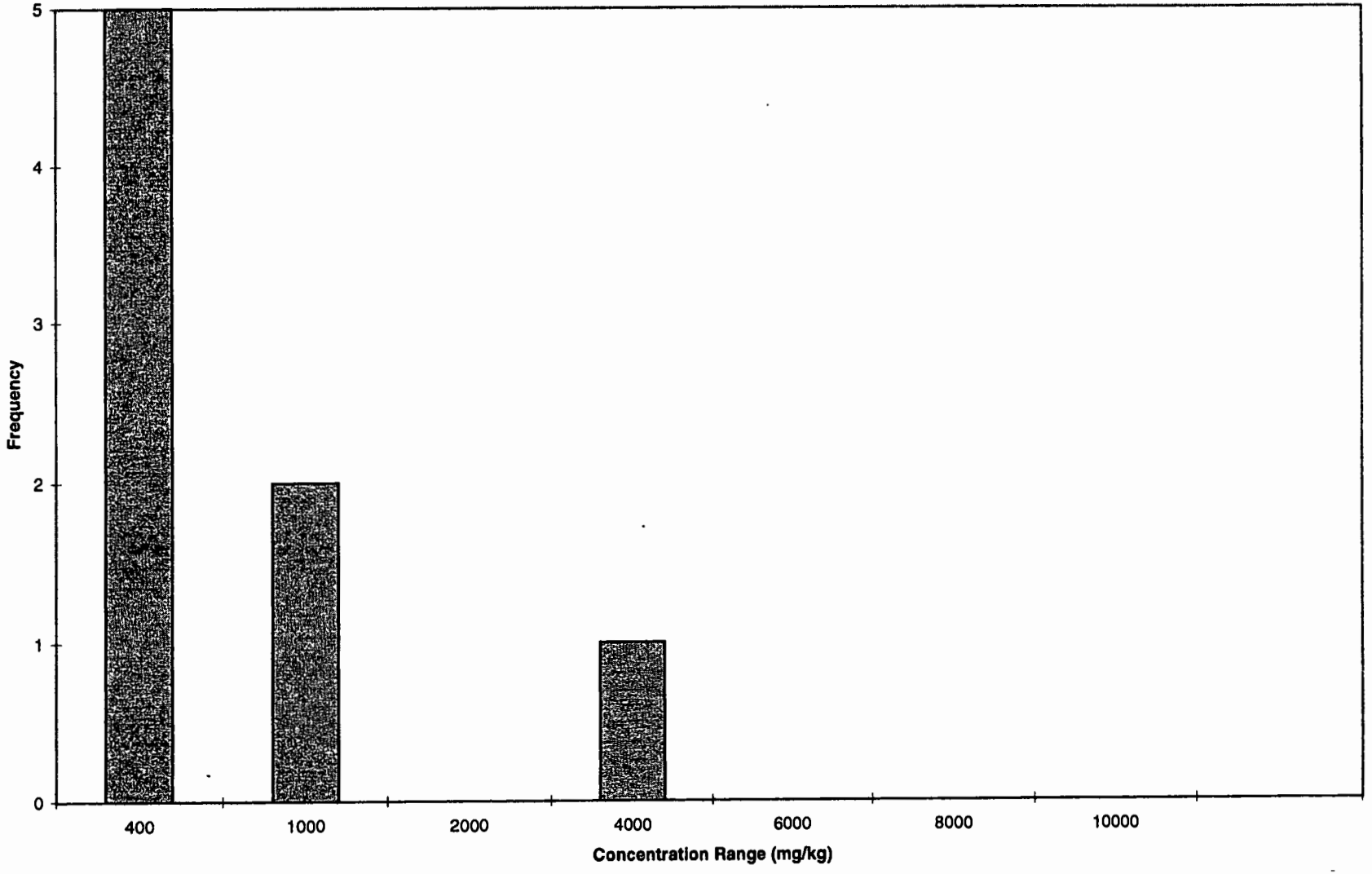
Mare Island Lead Based Paint Survey
Building 928 XRF Soil Lead Summary Statistics

Normal probability plot (LOGNORMAL CASE)



928XRFP.XLS

Mare Island Lead Based Paint Survey
Building 928 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 928 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
307.71
460.21
379.48
222.9
196.8
190.28
1940.3
832.08

Number of samples	8	Uncensored values	
Uncensored	8	Mean	566.23
Censored	0	Lognormal mean	559.26
Detection limit or PQL	150	Std. devn.	593.717125
Method detection limit		Median	343.5945
TOTAL	8	Min.	190.2805
		Max.	1940.3435

Lognormal distribution?		Normal distribution?	
r-squared is:	0.889	r-squared is:	0.674

Recommendations:

Reject BOTH lognormal and normal distributions. See Statistics Guidance.

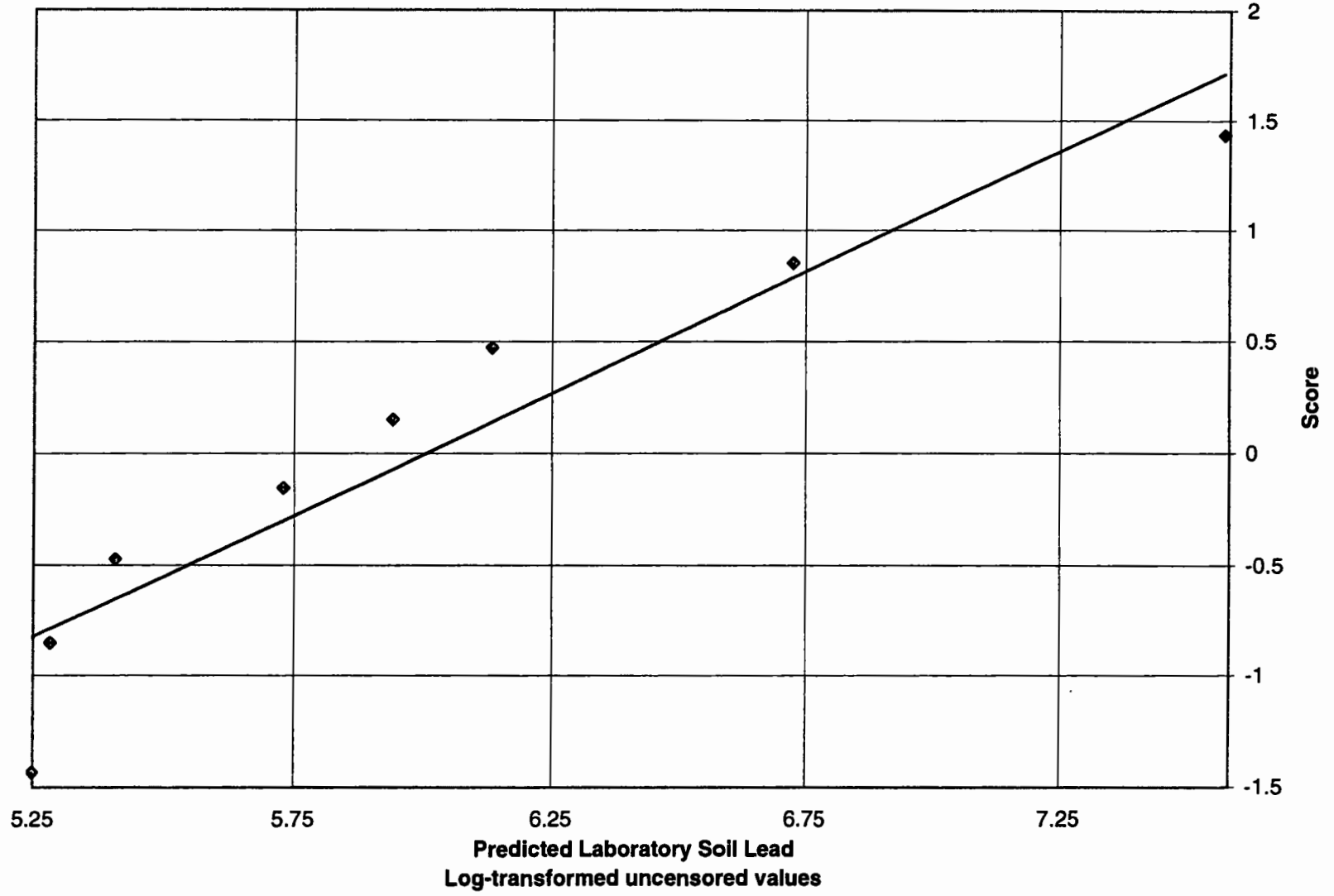
UCL (Land's method) is 1373.67

UCL (based on Z-statistic) is 911.529

Predicted laboratory concentration calculated from regression equation

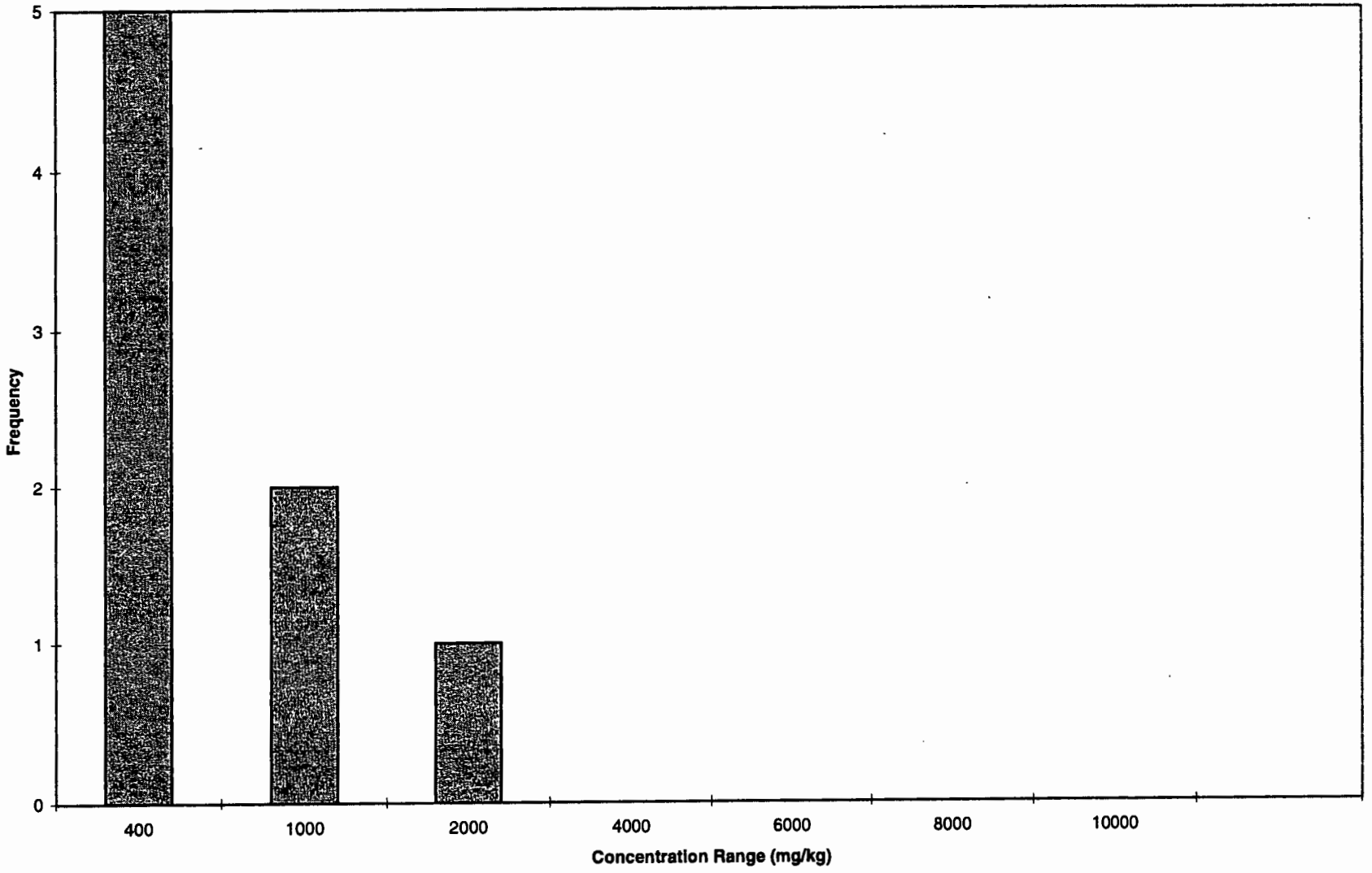
Mare Island Lead Based Paint Survey
Building 928 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



928LABP.XLS

Mare Island Lead Based Paint Survey
Building 928 Predicted Laboratory Soil Lead Frequency Distribution



Mare Island Lead Based Paint
Building 1294 XRF Soil Lead Summary Statistics

Conc. (mg/kg)		
68	J	
79	J	
110	J	
469		
83	J	
261		
100	J	
100	J	
55	J	
63	J	
62	J	
76	J	
65	J	
50	J	
69	J	
79	J	
100	J	
69	J	
50	J	
45	J	
74	J	
64	J	
60	J	
83	J	
108	J	
115	J	
111	J	
75	J	
104	J	
127	J	
139	J	
64	J	
56	J	
45	J	
66	J	
104	J	
102	J	
57	J	
72	J	
57	J	
95	J	
111	J	
63	J	
89	J	

Number of samples	44	Uncensored values	
Uncensored	44	Mean	93.05
Censored	0	Lognormal mean	90.39
Detection limit or PQL	50	Std. devn.	68.1223095
Method detection limit		Median	75.5
TOTAL	44	Min.	45
		Max.	469

Lognormal distribution?		Normal distribution?	
r-squared is:	0.843	r-squared is:	0.493

Recommendations:

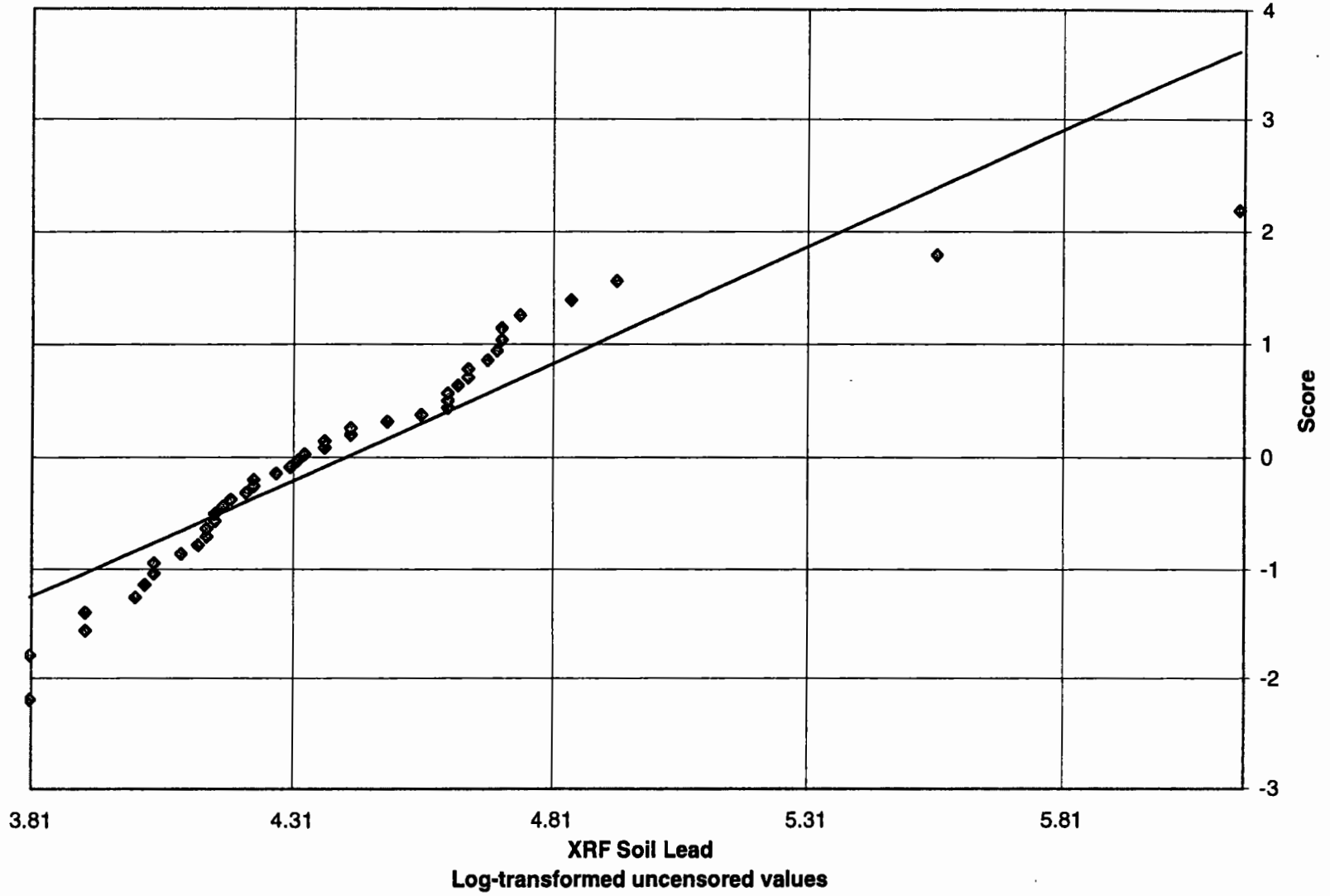
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (Land's method) is 102.13

UCL (based on Z-statistic) is 109.939

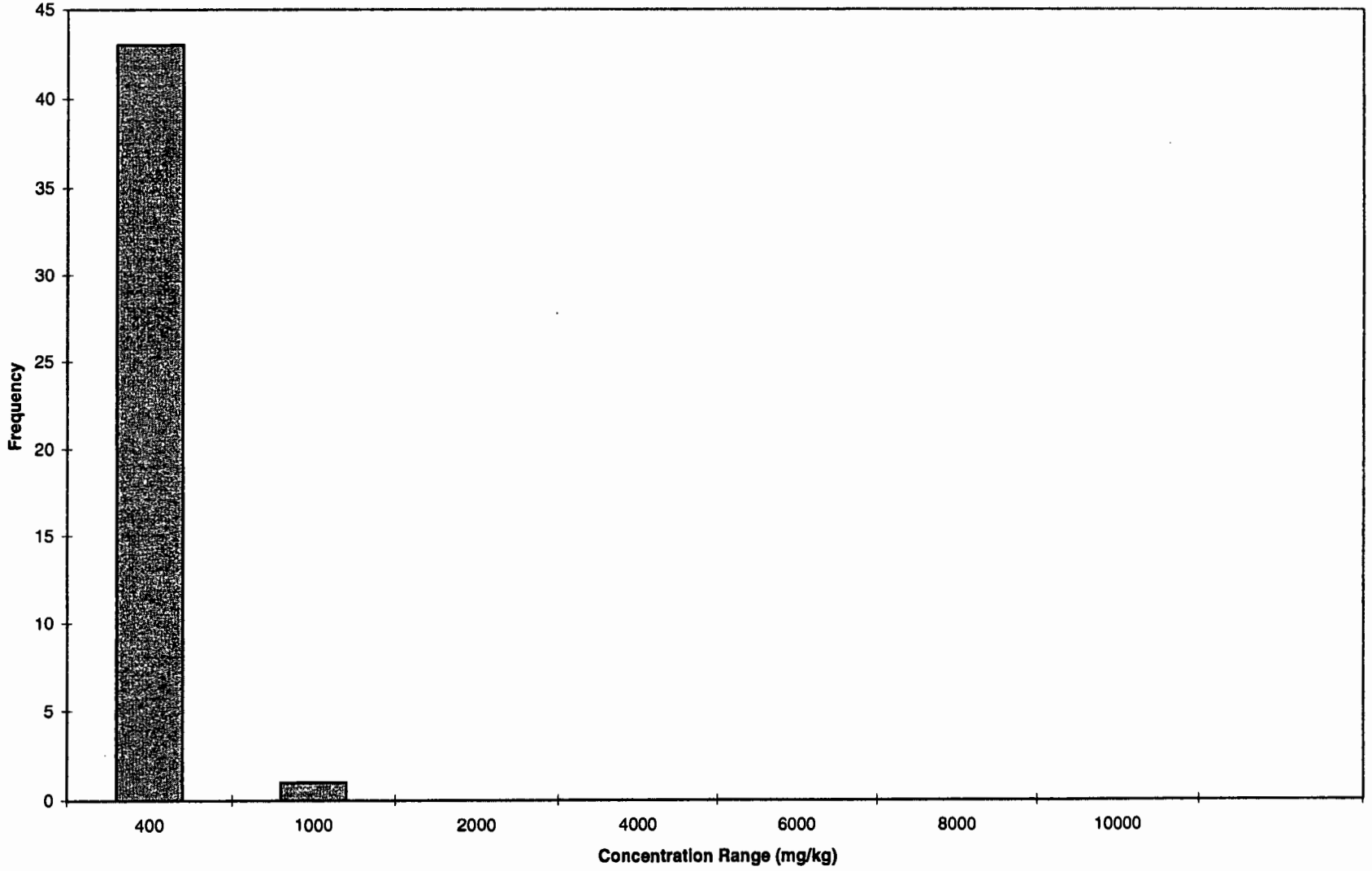
Mare Island Lead Based Paint Survey
Building 1294 XRF Soil Lead

Normal probability plot (LOGNORMAL CASE)



1294XRFP.XLS

Mare Island Lead Based Paint Survey
Building 1294 XRF Soil Lead Frequency Distribution



Mare Island Lead Based Paint Survey
Building 1294 Predicted Laboratory Soil Lead Summary Statistics

Conc. (mg/kg)
171.52
180.49
205.78
498.54
183.76
328.92
197.62
197.62
160.92
167.45
166.63
178.05
169.08
156.85
172.34
180.49
197.62
172.34
156.85
152.77
176.42
168.26
165
183.76
204.14
209.85
206.59
177.23
200.88
219.64
229.42
168.26
161.74
152.77
169.89
200.88
199.25
162.55
174.79
162.55
193.54
206.59
167.45
188.65

Number of samples	44	Uncensored values	
Uncensored	44	Mean	191.95
Censored	0	Lognormal mean	191.08
Detection limit or PQL	150	Std. devn.	55.5537434
Method detection limit		Median	177.64025
TOTAL	44	Min.	152.7675
		Max.	498.5395

Lognormal distribution?		Normal distribution?	
r-squared is:	0.674	r-squared is:	0.493

Recommendations:

Reject BOTH lognormal and normal distributions. See Statistics Guidance.

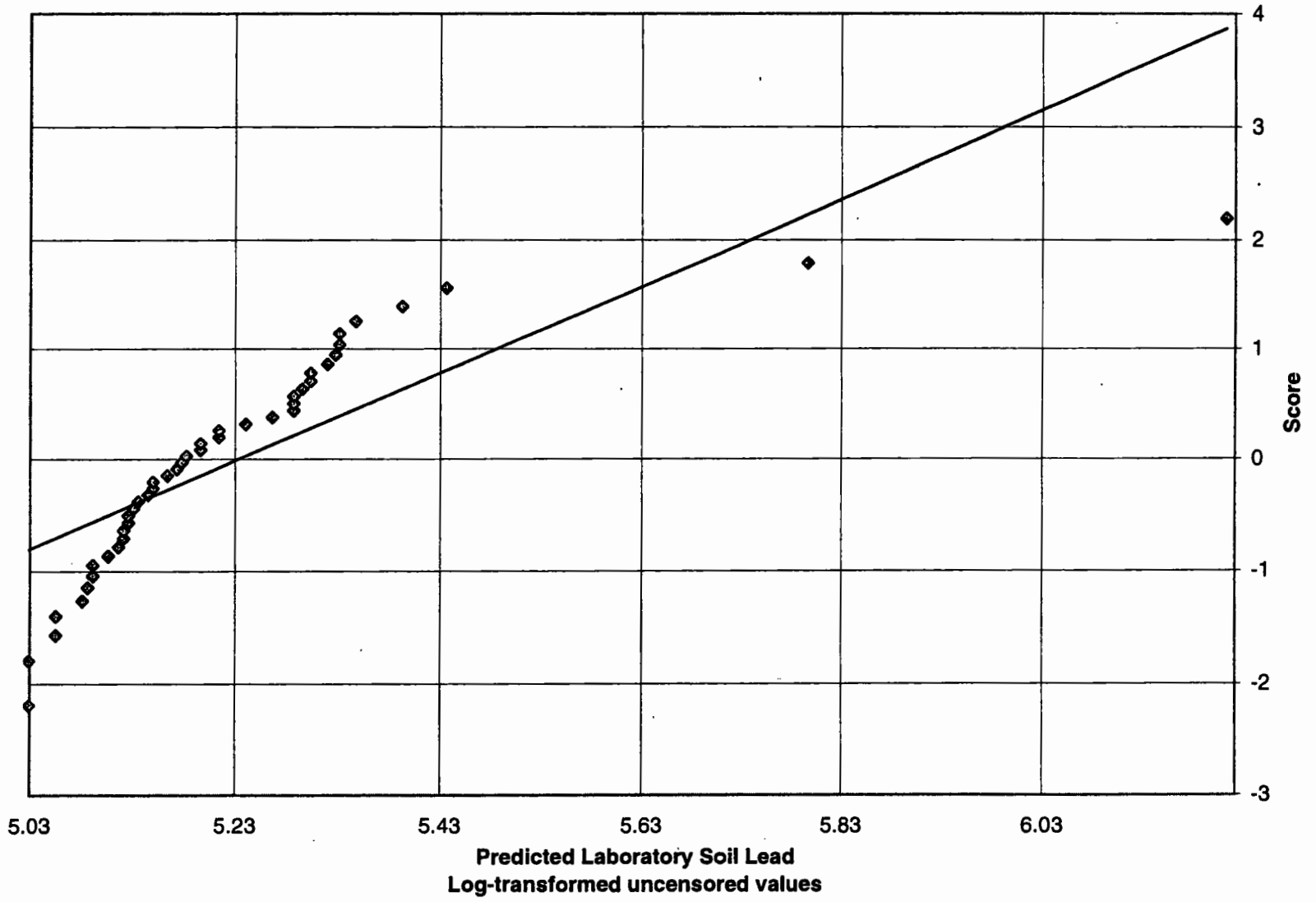
UCL (Land's method) is 201.61

UCL (based on Z-statistic) is 205.726

Predicted laboratory concentration calculated from regression equation

Mare Island Lead Based Paint Survey
Building 1294 Predicted Laboratory Soil Lead

Normal probability plot (LOGNORMAL CASE)



1294labp.xls

Mare Island Lead Based Paint Survey
Building 1294 Predicted Laboratory Soil Lead Frequency Distribution